College of Hawaii Publications

COLLEGE RECORDS *NUMBER 9*

COLLEGE OF HAWAII

REPORT OF

BOARD OF REGENTS

TO THE

LEGISLATURE OF 1913

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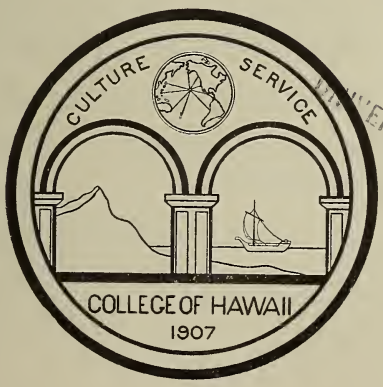

HONOLULU:
PUBLISHED BY THE COLLEGE
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Report of College of Hawaii.

To the Legislature of the Territory of Hawaii:

In compliance with Act 24 of the Session Laws of 1907, the Board of Regents of the College of Hawaii hereby transmits the report of the President of the Faculty showing financial statement and exhibits, together with the recommendations for appropriations for the coming biennial period.

Respectfully submitted,

HENRY E. COOPER,
President, Board of Regents.

Honolulu, T. H., February 1, 1913.

Report of College of Hawaii.

To the Board of Regents,
College of Hawaii, Honolulu.

GENTLEMEN—

I respectfully submit herewith a report of the College of Hawaii covering the period January 1, 1911, to December 31, 1912. This period covers practically four semesters of College work ranging in three college years. The report consists of two parts—a report of the President covering matters in general and a more detailed report of each Department written by members of the Faculty representing their respective departments.

STANDARDS.

The enabling act of the College specifies that "the standard of instruction in each course shall be equivalent to that given and required by similar colleges on the mainland." In accordance with this provision the College has organized its subjects of instruction under four collegiate courses leading to the Bachelor's degree. In addition to this the College offers instruction by correspondence, special lectures, and short courses to those not regularly prepared for college work or who cannot attend the regular classes of the College. This branch of work constitutes the Extension Department which is described later in this report. The regular courses have been described in previous reports, so there is no object in going into that detail here. Suffice it to say that the standards have been kept up, and the College held its first Commencement last June, at which time the following four students were graduated:

Leslie Cooper Clark, Agriculture.
Louise Gulick, Science.
William John Hartung, Science.
Yong Fook Tong, Engineering.

Two of these were students in the College from the beginning, while the other two entered with advanced standing from colleges on the mainland. All of these graduates have found employment in their chosen fields at salaries ranging from $900 to

$1500 per year. Invitations to this first commencement were sent out quite generally throughout the Islands and there were more than 400 in attendance. As a matter of record, it should be stated that this was the first occasion for the granting of Bachelor's degrees ever offered in the Territory.

Lands.

The Puahia tract comprising about thirty acres, mentioned in my last report as being under lease, has now been acquired. Possession was acquired through action by the Attorney-General against the lessee for the nonpayment of the stipulated rental for a number of years. Permission was obtained from the Commissioner of Education to use a small portion of Federal Funds for the purpose of clearing a portion of these lands to the end that instruction in soil management and crop production might be carried on. Consequently, about $2000 were spent for the clearing of stone from about fifteen acres. The stone thus removed was piled on adjacent land and will be available later for the construction of roads and drives. Most of the land that has been cleared has now been planted to forage and seed crops for purposes of instruction and demonstration. With the lands and waters now in possession, the College is in position to develop strongly in the various lines of practical agriculture. Certain developments are needed along several lines, but these are amply set forth in a report (Exhibit 3) by Prof. Krauss for the Department of Agriculture.

Buildings.

The matter of greatest moment to the College during the past biennium has been the erection of the new building and the moving into it. During the last session of the Legislature there was appropriated from Loan Funds the sum of $75,000 for the purpose of erecting a new building on the permanent grounds of the College in Manoa Valley. The Governor kindly allotted to the College the amount appropriated from the first bond issue, so that the College was enabled to enter upon the construction of the building at the earliest possible date. Ripley and Reynolds were employed as architects to draw up plans and specifications. After advertising for tenders, the Board of Regents awarded the contract for the erection of the building to the Lord-Young Engineering Company for $65,700. In addition to this the architects were paid $3942 for the plans and

specifications, and the remainder has been spent for furniture, equipment and extras. It is considered by the many who have expressed themselves that this is the best building, when room, quality and cost of construction are considered, in the Territory. It embodies the three essentials of a college building, room, convenience and light, and is satisfactory in every particular.

The new building does not provide room for the Department of Chemistry and the forge, wood and testing laboratories. In order to accommodate these branches the old wooden buildings, formerly occupied in town, have been moved to a site adjacent to the new building and there furnish ample room for the work in the branches mentioned, all of which have been enlarged. The cost of moving these wooden structures was $1818.40 as set forth in the financial statement.

These new developments on the permanent grounds in Manoa Valley have been made in accordance with the plans for the growth of the College, which have already been submitted. And from these beginnings it is reasonably assured that if the plans are carried out the College will develop into a most useful and attractive institution.

Students.

The Catalog of 1910-11 records an attendance of 145 students, twenty regular students, or those studying for the degree, and 125 special students, or those taking one or more subjects in accordance with their needs. The Catalog of 1911-12 shows an enrollment of 160, twenty-eight of whom are regular and 132 special. For the present year the enrollment is divided as follows: Total, 128; regular, 24, special, 104.

Not a few of our regular students desire to gain a part of their educational experience from institutions on the mainland. Some of them plan, therefore, to spend their first or second years here, and finish their courses at some other college. Nine of our regular students left the College last year for this purpose. While we should be pleased to have as many as possible of our students stay for graduation, yet it is well, if they have the opportunity, to go to a mainland institution, and it is gratifying that the work of the College is of such standards as to enable them to continue their work without the loss of time.

The younger members of the student-body have engaged from time to time in various athletic activities and these games have been entered into with a commendable spirit of sportsmanship and fairness. This year many members of the student-body have

been active in theatricals, and the public presentation of their play in Honolulu and on Maui has created considerable sentiment in favor of the College and its work.

Faculty.

During the biennium covered by this report the Faculty has been increased from 18 to 21 members. During the period the Librarian, Miss Carrie P. Green, and Dr. H. H. Severin, Professor of Entomology, have resigned, the former to take up work in the Library of Hawaii, and the latter to return to the mainland. Dr. J. F. Illingworth has been appointed as Professor of Entomology. The work in the Department of Agriculture and the Department of Botany has grown beyond the ability of one man to care properly for each of these Departments. Consequently, Mr. Leslie C. Clark has been appointed as instructor in the Department of Agriculture, and Miss Louise Gulick was appointed instructor in Bacteriology. These two appointments were well made, for there is much interest in these lines of work.

Sugar Technology.

With the added room and the increased facilities rendered by the new building and the moving of the old buildings to the new grounds, the College has been enabled to enter upon a new line of work—the establishment of a Department of Sugar Technology. This line of work has been contemplated for more than two years, but laboratory room and other facilities were not possible in the old building. The entire room and facilities were completely occupied by the lines of work required by the students in regular courses. Professor Herbert S. Walker has been appointed to take charge of this work. He has had wide experience in the sugar industry and has a liberal training in the chemistry of the subject. It is believed that the work of this Department will bind the College even more closely than ever before to the interests of the people and the industries of the Territory.

Extension Work.

It is gratifying to be able to report a hearty spirit of cooperation on the part of each member of the faculty. In the beginnings of an institution of this kind versatility and cooperation are essential factors in its success, and these have been manifested to a marked degree by this faculty.

More than two years ago extension work was organized in the College. The main object of this enterprise was to transmit in various ways the benefits of the College, including its library facilities and the information possessed by the various members of its staff, to those who are not in a position to attend the College in person or to take part in its regular exercises. The College executes its objects in this line of work in the following ways:

First. Short Courses. Since 1908 short courses have been held in the College, generally in the afternoon and evening, in order that those engaged during the day might attend. The subjects covered the whole range of Agriculture, Home Activities, Sanitation and Health, and Conservation and Industry. The attendance at these short course lessons has been good.

Second. Movable Schools, by which is meant lectures, demonstrations and conferences held in other towns than Honolulu. This enterprise has not been followed up because of the expense entailed.

Third. Classes for Kindergarten Teachers. Classes in Botany, Zoology, Nature Study and kindred subjects have been offered.

Fourth. Correspondence Courses. This work has probably been more effective than any method for the dissemination of knowledge. By it both regular studies have been carried on in accordance with the needs of the correspondent, and also specific questions and problems have been discussed. The subjects that have been handled in this line of work are Soils and Crops, Plant Life, Poultry Culture, Practical Cooking, and Zoology.

Fifth. Traveling Libraries. Four boxes of books containing about 25 volumes each have been sent out to the various schools, one box on each of the largest Islands. These books deal with agriculture and home subjects and remain in each school for one month when they are sent on to the next.

Sixth. Hawaii Educational Review. Recently the College has entered into cooperation with the Department of Public Instruction in publishing a monthly journal. This journal contains articles on education, agriculture and kindred interests and is sent to about 7000 persons throughout the Territory.

It is believed that extension teaching is one of the most praiseworthy activities of the College. It is fundamentally good because it renders the College useful to a maximum number of people, and broadens the service of its equipment and facilities.

Needs.

The greatest need of the College at the present time is the means for clearing the campus of the College, laying out the

necessary roads and planting the ground to suitable economic and ornamental plants. It would be a most praiseworthy effort if some person of wealth would establish upon these grounds a Botanical Garden where all the plants of the tropics suitable to this elevation, climate and soil could be grown. The College not only requires for its work in Botany and Horticulture a large collection of plants, but there are many people coming to Hawaii every year who want to see as many tropical plants growing in one place as possible. Such a collection as this would serve several admirable purposes. As it is, sufficient money should be provided to clean up the grounds, build the necessary roads and keep the grounds in an attractive appearance. In the development of the grounds, the provision of a suitable play ground is essential. It is not so much an athletic field that is needed as a suitable place where the students can engage in plays and sports as exercise to counteract the mental fatigue due to long hours of study. There is a tract of about four acres on the grounds which could, at relatively little expense, be made into a very attractive play ground.

The Dairy and Livestock Department of the College, and, in fact, the Agricultural Department as a whole has attracted a good deal of attention during the past two years. While the students in the department have not been many, yet they have shown a keen interest, and especially in the poultry work. A number of demands from all over the Islands have been made for bulls, fowls, eggs and pigs for the purpose of improving the local herds. In view of these demands and these interests the Dairy should be enlarged to meet the growing work and demands of the College. There should also be established a piggery comprising modern sheds and pens. The stock can be purchased from Federal Funds as soon as the means are provided for their keeping. Two years ago $4000 from the Income Tax was allotted to the College, but this was afterwards cut off. The College ought to be looked upon as a conservation agency. The income from the sale of produce from the farm now amounts to about $135 per month, but in order to make the work and resources of this department more effective, cottages should be built on the land for the accommodation of the labor necessary to keep it up. By virture of an amendment to the charter of the College made by the last Legislature, the College is enabled to utilize its income towards defraying the upkeep expenses of the farm. This provision has resulted in great benefit to the Department.

The College lands are bordered on one side by the stream that drains Manoa Valley. The farm lands of the College have a right to the use of a part of the water of this stream. The rainfall of this valley, however, is very heavy and consequently a large quantity of water goes to waste through floods. The waters of this stream should be developed for the use of the College as well as for the use of others interested. A dam should be built and provided with the necessary weirs, gauges, gates and other appurtenances of an efficient hydraulics laboratory. At this time when water conservation is prominent in the activities for community betterment, the use of this stream and the College facilities as a base for future operations would be in order.

The Department of Engineering has rendered good services to several industries and interests of the Territory during the past biennium. The details are set forth in the report of the Department. In order to keep up this work and to meet the growing needs for work of the kind that it has been doing an addition to its building is urgently needed. This addition would provide for the proper setting of the several large testing machines which the department now has in its equipment.

In order to meet the needs above mentioned the College would request appropriations to cover the following operations:

1. Maintenance expenses for the biennium.
2. Sufficient funds to improve and lay out the grounds.
3. Funds for improvements for the Live Stock Department.
4. Funds for the construction of Dam for water conservation.
5. Funds for the additions to the Engineering Laboratory and for laborers' cottages.

Library.

The Library now contains about 9000 volumes and 10,000 pamphlets. Most of these books are of a technical nature, and the number is constantly being added to. Many people outside of the College consult the books for technical information on various subjects. The Library is by Federal Statute a depository for all government publications, and these are placed on the shelves for reference.

FINANCIAL STATEMENT.

Biennial appropriation for salaries, pay roll and expenses	$20,000.00	
Expended 18 mos. Dec. 31,'12, for:		
Regular pay roll		$ 8,581.60
Labor pay roll		1,412.70
Books, stationery and postage		735.65
Supplies		1,907.74
Moving expenses		1,818.40
Office and General		376.82
Sundries and Miscellaneous		217.77
Balance unexpended		4,931.32
Total	$20,000.00	$20,000.00
Realizations, Act 44, S. L. 1911	$ 2,850.44	
Expended 18 mos. Dec. 31,'12, for:		
Labor		$ 2,674.73
Lumber and supplies		175.71
Total	$ 2,850.44	$ 2,850.44

Respectfully submitted,

JOHN W. GILMORE,
President of the College.

EXHIBIT 1.

REPORT OF THE DEPARTMENT OF HUMANITIES.

To the President of the College of Hawaii:

I have the honor to submit, in compliance with your request, a report on the work done during the year 1912 in those subjects which in our Catalogue are listed under the head of Humanities.

EQUIPMENT AND FACILITIES.

The most noteworthy happening of the year was the removal from the temporary quarters on Beretania Street to the new building in Manoa Valley. The importance of this change from dusty, noisy, overcrowded, and unattractive buildings to the quiet, airy, commodious, and dignified college hall set amid the beauties of Honolulu's most charming valley cannot easily be appraised. It has added to the comfort of work; it has increased the effectiveness of our work; but even more important to the welfare of the College, I believe, has been the subtle but nonetheless real effect upon the spirit of both the teachers and the

students. We are like the ragged who put on garments clean and whole, or the dweller in a squalid tenement, who, not having lost his self-respect, finds himself moved to a respectable home of his own.

To be sure, not all our needs have been met. Some of our class-rooms, for instance, are at times so flooded with sunshine as almost to blind the occupants. For the English classroom, in which this condition was most trying, curtains have already been provided; but they are needed in only a lesser degree in both the French and the German rooms. Any walking during class hours over the bare floors of the corridors or up and down stairs is an annoyance both to teacher and class, especially so since for the sake of ventilation our classroom doors must be kept open. I would suggest that both halls and stairs be covered with heavy linoleum. We have only one clock, placed inconspicuously in one of the class-rooms, and hence no way of calling attention to the time for beginning and closing class exercises. As a consequence classes are sometimes kept ten, fifteen, twenty minutes over time, thereby seriously interfering with work in the classes to which the detained students should have reported. Then, too, we have about as many systems of time in the building as there are watches. We need a great striking college clock, or a system of automatic bells. The walls of corridors and class-rooms are as bare as the walls of a factory; it would be desirable to begin a collection of pictures and other works of art. But most of all we need an auditorium, a hall that can be separated from the remainder of the building, large enough to seat several hundred persons, and fitted with an elevated platform or stage. Inasmuch as even high schools are now given such a room, it seems superfluous to point out the uses to which it would be put. But there is one condition peculiar to the College at present that may be pointed out in this connection. All our regular students remain at the College during the entire morning; the time not taken by recitations and lectures is given to study; and the only place they have in which to study is the library. Even now this room is hardly large enough; soon new shelves must be added, thus lessening the space available for readers. Even if the number of students were not to increase, and I cannot doubt that it will, there will soon be insufficient room in the library. Moreover, this room should be reserved for those who are consulting the library books and wish to work without being disturbed. In connection with an auditorium, then, there should be built a large study hall. Both the audi-

torium and the study hall are real needs today, and it seems none too soon to give them attention.

Mathematics, History and Economics.

The courses in mathematics and in history and economics have been given faithfully in accordance with the outlines stated in the Catalogue. No especial problems have arisen, and the teachers in charge do not report any requests or recommendations. I know, however, that the professor of mathematics finds that some of his students are not properly prepared for advanced work, and that he has cheerfully given private instruction gratuitously to enable these students to make up their deficiencies. At what other institution of higher learning would this be done! I have had ample opportunity to observe the difficulties in which many freshmen find themselves on entering a large university, where hundreds are taking the same courses. The subjects are difficult, the methods are strange, and even though the instructor be experienced and sympathetic the classes are so large that a student must of necessity struggle by himself. I feel confident that as soon as the people of these Islands become aware of the peculiar advantages offered by the College of Hawaii they will wish their sons and daughters to get their initiation in college work here, even though for social or sentimental reasons or for the broader experience that comes from a change in environment there is later a transfer to a college on the mainland.

Modern Languages.

The work in modern languages brings up some important questions. Since I have been connected with the College the courses in German have been conducted by an instructor in German, the courses in French by an instructor in French. During this period of less than three years there have been two different instructors in German and four different instructors in French. To most of them, at least, the College work was secondary if not incidental. I do not mean to imply that these teachers have not been qualified or that they have not been faithful to their obligations. But it must be said that these frequent changes have not been altogether for the good of the College. Quite apart from the advisability of having all the members of the faculty take some part in the legislative and executive details of college administration, quite apart from any consideration of the development of an *esprit de corps,* satisfactory results can be obtained only when some definite system of instruction is

established and maintained; and this is particularly true in the study of modern languages, where success in advanced classes depends so directly upon thorough and systematic drill in fundamentals. A new instructor must under the best of circumstances spend considerable time in acquainting himself with his students and their proficiency, and if in addition he finds it necessary to spend time in reviewing and supplementing their knowledge, he cannot possibly cover the requisite ground; and thus our standards are seriously lowered.

Another hindrance to effective work is found in the admission to our classes of so-called special students, i. e., students who come without being able to meet in full our entrance requirements and without the desire of obtaining college credits for their work. Not only are many of these students insufficiently prepared, but under the stress of social or household duties they do not hesitate at times to neglect their college work entirely. To enable such students to make any progress a considerable part of a recitation period must be given to their individual needs. The inevitable result is that the regular students suffer. It may be well to ask ourselves if it would not be wise either to demand entrance examinations or to establish special extension classes. Such extra classes are in fact being held this year by the Instructor in French for fifteen special students.

The position of French in the College appears at present to be somewhat uncertain. For this uncertainty there are probably good reasons with which I am not familiar. But it may be pointed out that if we abandon French we shall have the distinction of being, so far as I know, the only college in America that does not offer its students an opportunity to study both French and German. If a strictly utilitarian view is taken, we must admit that the French have held a very important place in the development of science and that there is much French scientific literature, which must remain closed to the student who knows only German. Moreover, a knowledge of French literature is an important part of a general education. To the importance of a general education I shall have to refer later. Here I can only ask the question: if, in the present condition of the College it seems inadvisable to have both an instructor in French and an instructor in German, would it not be possible to appoint a professor of modern languages?

English.

The courses in English have been shaped as far as possible to meet local conditions. Here the teaching of English presents

peculiar difficulties because to the majority of the people of these Islands English is not the native tongue. Not only do the ears of everyone become familiar with a most corrupt dialect, but a considerable number of our students come from homes in which English is not spoken at all. To these students English presents all the difficulties of a foreign tongue.

In Courses 1 & 2, English Composition, required of all regular students, the emphasis is given not so much upon English as upon composition. The work is in no sense a repetition of high school courses. Expression is regarded as a means, not as an end. Without neglecting correctness of expression, we lay stress upon those principles which must be observed by the effective writer whether he is expressing himself in English or in Chinese, to such matters, for example, as the unity, coherence, emphasis, and exactness of the thought. The student is encouraged to acquire not only the negative virtue of avoiding errors, but the positive virtues of the logical and exact thinker.

Another detail of the work in this class may be mentioned. In *The Atlantic Monthly*, to which each member subscribes for at least three months, we read and discuss in class such of the articles as deal with the greater present-day problems and movements. We examine these articles partly to observe the authors' methods, but even more to understand his thoughts. The class writes on these subjects, and thus some knowledge and thought of certain of the more important phases of Anglo-Saxon civilization cannot be avoided. I have yet to find a student, no matter what his nationality, who was not sympathetically interested in the aims and ideals of our civilization. As a step in the Americanization of the Islands this work is, I believe, decidedly worth while.

In Courses 3 & 4, English Literature, likewise a required study, attention is given far less to memorizing names, titles, and dates than to acquiring some acquaintance with the progress of English thought and of social and political conditions. So far as time permits we read and discuss the literature itself.

In the fall of 1911 a course in short story writing was offered. Some twenty-three persons registered and attended so regularly and evinced such intelligent interest that, by request, the class continued until June, though it had been announced for only one term. All these students were specials, and of course unequally prepared, but the quality of the work turned out by some was gratifyingly excellent.

Under the direction of the Professor of English, students of the College have presented a play, the proceeds from which are

to serve as a nucleus towards the construction of a tennis court. Three performances were given in Honolulu, two in Bishop Hall, Oahu College, at Thanksgiving, and a third in the Hawaiian Opera House just before Christmas, for the benefit of the Malihini Christmas Tree Fund. During the Christmas vacation four performances were given on the Island of Maui. Although it may safely be affirmed that this activity has resulted in considerable good to the College, partly as training in the art of oral interpretation, and more largely in arousing and intensifying college spirit and in arousing public interest, the preparation for the play was attended by such difficulties that it is doubtful if another play will be attempted until such time as we shall have an auditorium in which rehearsals may be held and the play presented. Not once was it possible to rehearse on a stage with scenery and properties; and we shall hardly wish to make a practice of asking the favor of presenting our plays on the stage of another school, notwithstanding that the favor was this year most cordially granted. The time seems near when a class in public speaking and debate may be organized, but such a class cannot be conducted satisfactorily until a stage and auditorium are provided.

This year, for the first time, a fund was placed at the disposal of the Professor of English for the purchase of books to be placed in the College library. Very little of this money has been used to buy books of recent issue. Rather, the purchases have been of standard reference books and of older books which are indubitably for all time. It is most strongly hoped that this appropriation may be continued until our collection of standard works is more reasonably complete.

To the work in the Humanities the most of our students are at first rather indifferent. It is doubtful if many would register for these courses, mathematics excepted, the need of which the engineering student recognizes, were not these courses prescribed. Influenced by the rush and hurry of modern America, they want only those things which they regard as of immediate practical use; they want to know only of those things which they can actually see used to earn money. With these aspirations towards practical efficiency I have no quarrel. But I do not believe that men should be shaped in our colleges as tools are made in our factories, with the sole aim of immediate practical utility. Our college men, at least, should differ from other tools; they, at least, should be self-directing. They should be something more than instruments to be guided by another; they should not be trained only to work in gangs under the command of a

"boss." There are important aspects of this question which I cannot here consider. I shall not even touch upon such vital questions as the relation of education to the development of character, or what man shall *be* aside from what he can *do,* or of the relation of education to our national civilization. But keeping closely to the idea of utility, of man as a tool, I would point out that those leaders in education into whose hands are entrusted the guidance of our oldest and our strongest schools hold to the conviction that, even as a tool, as a machine for doing work, practical wisdom demands that he be be a *thinking* tool, that, in other words, the value of the tool depends largely upon the wisdom and the manhood within the tool. Hence it is that as fast as circumstances will permit these schools are requiring as a prerequisite to technical training one, two, four years' study of the humanities. And I wish to quote in conclusion from an address of Dr. James Morgan Hart, Professor Emeritus in English in Cornell University, delivered at the recent celebration of Founder's Day at Cornell, first explaining that in Goldwin Smith Hall are taught those subjects known as the Humanities.

"Some months ago I was conversing in front of Morrill Hall with one of our best-known professors in technical science. Our conversation turned naturally upon students and studies. Suddenly the professor turned around and—pointing to Goldwin Smith Hall—said abruptly, spontaneously: 'There is the heart of Cornell University!' And I said to myself: Good; were Ezra Cornell here, he would smile his quiet approval. . . . . .

". . . And what are the humanities? Attempts to teach man to understand himself in the light of historical growth: Whether that teaching be in the form of philology, or of literature, or political history, of finance and economics, of metaphysics and ethics, it is always a study of the growth of the human spirit, and the effect of the teaching is to strengthen the student in living in the world after graduation a fuller and a richer life. That is what Goldwin Smith Hall stands for, what Goldwin Smith himself stood for. If the humanities are to be something above mere intellectual gymnastics, they should stand firmly and squarely, deep-rooted, in the full tide of humanity. Nor is it mere accident that, since the erection of the hall, our professional schools are beginning to lean upon it. They tend more and more to encourage and even to require Goldwin Smith studies.

"It is only truth, then, that Goldwin Smith Hall is the life-blood of the university. After our professional graduates have

established themselves in their respective callings, are what the world calls successful, they discover with regret that, unless they have undergone on the way some of the educative manipulations of philosophy in this broader sense, their outward success is hollow at the core. And this will be peculiarly true of our graduates in agriculture. . . . The country people who can not enjoy reading are on the road to trouble. Intelligent, sympathetic reading, however, presupposes training. The only adequate training will be found in some form of humanistic study."

Very respectfully submitted,

ARTHUR L. ANDREWS,
Professor of English.

EXHIBIT 2.

REPORT OF THE DEPARTMENT OF GENERAL SCIENCE.

To the President of the College:

In accordance with your request I present herewith a report of the Department, comprising reports of its several divisions.

DIVISION OF BOTANY AND HORTICULTURE.

FACILITIES AND EQUIPMENT.

This department occupies six rooms in the main building, as follows—one laboratory and class room, one herbarium room, one office, one research laboratory, one dark room, one storage room. In addition to these rooms, the department utilizes the photographic laboratory; and has a small slat-house on the College farm.

The laboratory is furnished with standard microscopes and work tables, individual lockers, chart cabinets, balance cabinet, reagent and supply cases, electric table-lamps, tap, filtered, and distilled water, and numerous gas-burners for heating material. Lighting will be so arranged that stereopticon projection may be used at any time.

For work in plant histology and pathology, and bacteriology, the laboratory is furnished with Arnold sterilizers of several types, three autoclaves, incubators, refrigerator, water-baths, paraffine-baths, imbedding oven, electric centrifuge, precision

and student microtomes, balances, filtration apparatus, a large stock of chemicals, stains, and reagents of the best quality, and supplies of all requisite glassware.

Standard apparatus for experimental work in plant physiology, as planned by Ganong of America, Detmer of Germany, and Dey Rolles of France, is provided, together with facilities for the construction of original apparatus, and for the study of plants in aquaria, thermostats and other control devices.

Photographic equipment consists of an 8x10 enlarging and reducing camera; several portable cameras for various kinds of work; a panoramic outfit; ray-filters, tele-photo attachments, and other needful accessories.

The microscope equipment comprises Bausch and Lomb and Leitz microscopes, including the best patterns of demonstration, projection, portable, photo-micrographic, research, and elementary instruments. Accessories include Abbe camera lucida, filar, ocular, and stage micrometers of several types; spectro-micrographic equipment; mechanical stages, warm stages; and series of Leitz, Seiss, Bausch and Lomb, and Spencer lenses. For photo-micrography there is a Bausch and Lomb horizontal camera, with all needful accessories.

For field excursions and biologic survey-work, the department has collecting cans and cases, portable plant presses, field instruments for the recording of meteorologic data, binoculars, Abney level, pocket sextant, prismatic compass, and other field equipment.

Illustrative material is used abundantly in all courses. In addition to freshly collected material, which is available at all seasons, there are severa herbaria; special collections of algae and lichens, conifer material from Maine; complete set of wood-sections by Hough, and photo-micrographs by Weale; series of commercial woods, drugs derived from plants, spices, nuts, grains, fibers, vegetable oils, and gums, and other economic products; a large series of Dey Rolles models in staff; and a set of fossil plants from Ward.

Wall-charts by Wolff-Maage, Engleder, Goering, Kny, and others supplement the growing collection of lantern slides and photographs.

The library includes the standard works and files of important periodicals. For geographical studies there is an 18-inch suspension globe by Johnson, large wall maps of world-divisions, and of the islands of this group, and a number of excellent atlases.

Horticultural material includes extensive collections of flowers, vegetables, and ornamental seeds; spray materials and mixtures; garden tools, including spray pumps of several types; a garden herbarium; and a series of Dey Rolles models in staff, illustrating important fruit types, methods of grafting, etc.

Plans are now under way for utilizing suitable portions of the college land for permanent orchards, gardens, slat-houses, and other accommodations for the horticultural activities of the department. There are now available benches, flats, pots, supplies of various potting media, raffia, etc., spray machinery and materials, and other useful horticultural implements.

Attention is called to the remarkable variety and abundance of plant life in the vicinity of Honolulu. The facilities for botanic and horticultural studies are unique, perhaps unparalleled. Within a radius of a few miles of the botanic laboratory are a deep-sea flora, coral reefs, coral-, lava-, and tufa-beach floras, coastal-plain, foothill and mountain floras. The marine and the mountain (4000 ft) floras are both remarkably easy of access.

There is not only this rich abundance of indigenous plant life, but also a bewildering variety of introduced plants. There is a great diversity of flowering plants, grasses, ornamental shrubs and vines, vegetables, and small fruits, each species being usually represented by a number of varieties. There are complete facilities for the making of individual herbaria by students interested in taxonomic studies.

For advanced students doing research work, the general herbarium, under the charge of Mr. Joseph F. C. Rock, is available. This is the most complete collection in the world of the indigenous flora of Hawaii, and contains a large number of types, and much material identified by specialists.

The following account of the herbarium, by Mr. Rock, is of interest in this connection:

"Among the facilities of the department the herbarium occupies a place of great importance, but one that requires some explanation in view of possible misconception. An herbarium is a systematically arranged collection of authentically named dried plants, and is highly essential for instruction and research. It is somewhat of the nature of a museum, a laboratory and a library. As a collection or assemblage of plant material it resembles the museum. It might be included in the laboratory as an essential apparatus without which systematic work on plants is impossible, and as illustrated literature it is a kind of library extremely useful for reference.

"It is in the first place necessary that the herbarium should contain authentically named specimens, as it is not always possible to recognize plants by the brief descriptions which are sometimes published in various languages. Illustrative material is absolutely necessary to determine the plants of one's own environment and to be able to recognize species new to science. The determination of plant species is by no means the sole factor in botanical work, but is of subsidiary importance. An herbarium may be consulted for a particular specimen, the name of which may be known beforehand in order to compare its structure with other forms, or to ascertain the relationship of an unknown plant.

"The herbarium may be compared to a great illustrated volume, to the pages of which the botanist refers daily in quest of information. The administration of such an herbarium may be paralleled in the management of an office, as that of registry of deeds.

"The herbarium of the College is not extended indefinitely beyond the border lands of the Pacific, but comprises only such Floras as are closely related with the Flora of these Islands. Only in a few cases it was found necessary to have Floras, such as of Mauritius and other islands having an insular Flora, for of island floras botanists distinguish two kinds, 'insular' and 'continental' floras.

"As research in Hawaii is not limited to certain fields of systematic botany, as forest trees, but also is extended to grasses and pulses, it was found necessary to make the hebarium general in its scope, and it was desired that it should contain all the lower Cryptogams, as well as Phanerogams, for purposes of instruction and in order to give a general conspectus of the plants of these Islands. An herbarium should be looked upon, not as a show piece or an accomplished task, but as a growing and working mechanism that will return daily a large interest by way of instruction and research upon the capital invested in its establishment and maintenance.

"The major portion of this herbarium is that which came to the College as a loan for an indefinite period from the Bureau of Agriculture and Forestry.

"It being an impossibility to conduct such work without facilities for publication, it therefore may not be out of place to make a few general remarks regarding such. The dissemination of knowledge about plants is the very essence of botanical research activity. Unless the results of research are made known to the

scientific world through some precise announcement, they are of no value whatsoever.

"It is indeed of the greatest importance and advantage for an establishment of this kind to control its own publication to the extent of at least one or two bulletins, thus giving it the opportunity to express freely its individuality. I therefore recommend and urge this College to find means whereby we will be enabled to publish at least one series of bulletins, which shall appear whenever there is material on hand, either scientific or popular. By the freedom of exchange such contributions form the most useful and practical medium of communication between different institutions of the world, and will help to promote and advertise, as well as make the world acquainted with the work accomplished by the College in question."

And by request is given herewith a short resume of the book on the Indigenous Trees of the Hawaiian Islands by Mr. Rock, now in press.

"The book deals exclusively with the native trees; that is, such as were originally found here by the first white men, leaving out all the trees found about town, as they are of more or less recent introduction.

"It was the writer's idea to present to the public a book which would give information on trees strictly Hawaiian in both technical and popular language. Many times the writer heard the remark: 'But are there any native trees?' Yes, there are over three hundred, and, what is still more interesting, over 80% of them are not known from any other part of the world, but are peculiar to this small group of islands. The book contains such information as can not be found in other works on the subject. Most of these works are exceedingly technical and very expensive, and contain only fragments of Hawaiian botany, the rest being descriptions of plants from other parts of the world. There are a few lists of plants, such as were published by Horace Mann and Heller, but these are only for the use of experts. The best work on the Hawaiian flora was published by Dr. W. Hillebrand, in 1888, well known to the kamaainas. It also is extremely technical and without illustrations, save one showing the middle forest zone on Hawaii.

"The book about to be issued contains 214 full-page illustrations, all of them excellent half tones made by the Commercial Art Co., of San Francisco. Owing to the great cost of the illustrations it was impossible to have each species of tree figured, and so the more important ones which the traveler might meet in the forests of the various islands are illustrated. Most

of the trees are figured three times, showing the general aspect of the tree, the trunk showing bark characteristics, and the third a flowering and fruiting branch of the tree from live specimens. The descriptions are technical, giving also complete references to each species; accompanied by a popular description with all the native and common names, the uses of the tree, its legends, whether used in religious ceremonies, medicinal properties, etc., or other interesting feature connected with the tree. Then follows a complete description of its habitat, and where it can be found in the various islands of the group.

"The introduction to the book covers about 90 pages, giving a detailed description of all the floral regions and much ecological data. These pages are illustrated by 27 half tones, showing the various typical forest zones on all the islands from sea level to nearly 14,000 feet elevation.

"The writer hopes that the volume will be of some use to all those who are interested in this highly specialized flora of ours, and will help the novice to learn to know the trees of Hawaii nei of which the old Hawaiians possessed a thorough knowledge."

The staff of the department consists of four persons—a professor of botany and horticulture, a botanist, an instructor in bacteriology, and an assistant to the botanist (left Dec., 1912).

Courses.

The department gives required courses as follows:

Courses.	*Credits.*	*Required of*
Principles of Botany ..... 1st Semester.	3	Freshmen in Science, Agriculture and Household Economics.
Principles of Botany ..... 2nd Semester.	3	Freshmen in Science, Agriculture and Household Economics.
Dendrology	2	Seniors in Civil Engineering.
Bacteriology	3	Juniors in Science, Agric., C. E. and Household Economics.
Plant Propagation	3	Sophomores in Agriculture.
Principles of Horticulture.	3	Juniors in Agriculture.
Tropical and Subtropical Fruits	3	Seniors in Agriculture.

In addition to these required courses, there are offered five advanced courses in botany and two advanced courses in horticulture.

Number of Students.

The average enrollments, based upon the records of four collegiate years, are as follows: Botany 6, Dendrology 2, Bacte-

riology 8, Horticulture courses 3 each. It will be noted above that several of the courses in botany and horticulture are junior and senior requirements, and as yet these classes are small.

Needs.

A. A separation of the division into its two components,—botany and horticulture, and the appointment of a horticulturist, who will have charge of the new Division of Horticulture, offer the courses in horticulture, and have general charge of the Campus and grounds, insofar as landscape gardening and ornamental plantings are concerned.

B. An official unification of the horticultural activities of the College of Hawaii, the U. S. Experiment Station, and the Territorial Bureau of Agriculture and Forestry. This would permit students in the College to avail themselves of the well-developed horticultural work of these other stations, and prevent needless duplication of horticultural equipment and plantings upon the part of the College.

DIVISION OF CHEMISTRY.

Facilities and Equipment.

The division of chemistry is in a position to offer excellent training to those students who wish to specialize in this important branch of work. The facilities for such work are on a par with those of many of the leading mainland colleges. In addition to the usual equipment for courses in general chemistry and qualitative analysis, there are on hand apparatus and supplies for instruction in both elementary and advanced quantitative analysis, and for original investigation. To specify somewhat in detail, the laboratories are supplied with platinum ware, volumetric apparatus, chemical balances, apparatus for gas and oil testing and for food analysis, a bomb calorimeter, polariscopes, spectroscopes, a refractometer and apparatus for work in physical chemistry. Gas, water, and electricity are all at hand, and the equipment of desks and hoods is well adapted to present needs.

Courses.

There is first of all a thorough course in general chemistry, including laboratory practice, which is required of all regular students irrespective of the department of college activities in

which they may choose to work. Following this there are a number of courses, both theoretical and practical, some of which are required, and some of which may be elected by students registered in the Department of Science. Such courses, if conscientiously followed, will enable a student upon graduation to take up the duties of a chemist or to engage as a teacher in that science.

In addition, there are now being offered courses in sugar technology in order to prepare students for practical work as plantation chemists. It is hoped by such means to attract young men of Hawaii, as well as those of other places, and to train them to hold responsible positions on the plantations, thus filling a long-felt need. The equipment for such work at the College is excellent and is rapidly being increased. A man well fitted to give instruction along such lines has recently joined the college faculty.

Students.

At the present time there are enrolled in the various courses in Chemistry about twenty-five students. In the last two years about forty students have been enrolled. When the work in sugar technology gets fully under way the number of students will undoubtedly increase. The spirit manifested by the students in chemistry is excellent. Without exception they all appear interested in their work, and many of them have shown marked ability.

Needs.

The division of chemistry now occupies the old, wooden building of the College of Hawaii which formerly fronted on Beretania street and which was moved out to Manoa. Although these temporary quarters furnish adequate floor space for present needs, it seems very unwise to house so much valuable equipment, in the form of apparatus and supplies, in such a flimsy structure.

The greatest need is a *permanent, fire-proof building,* preferably of reinforced concrete, which will provide at least twice the floor space of the present quarters to allow for the proper development and expansion of work.

There is also needed a small, but completely equipped, sugar factory where a student may study the various steps in the process of sugar making at first hand; and where he may, himself, perform all the various operations involved, in order that

he may obtain a practical, as well as a theoretical, knowledge of the industry.

Provision for the payment of a small salary to a student assistant in the chemistry laboratories would also be greatly appreciated. Not only would such an assistant be able to relieve the professor in charge of much burdensome routine work, but the assistant himself would receive much valuable training.

DIVISION OF ENTOMOLOGY.

Facilities and Equipment.

The student of biology works under especially favored conditions in Hawaii. Since there is no dormant season, he is able to gather his material fresh at the time that it is wanted, thus avoiding the difficulties that arise when preserved specimens are used. The location of the College enables one to make field studies and collect specimens under a variety of conditions, extending from sea level to an altitude of about 4000 feet.

A collection is being developed which represents many of the most common economic forms, both local and from the States. Also, an abundance of other illustrative material is available for class use. The laboratories are well equipped with modern microscopes, dissecting lenses, glassware, and other necessary accessories.

Courses.

In all courses a special effort is made to have the student realize that he is dealing with forms which in many cases are of vital importance to his welfare. The lecture and laboratory work are closely correlated, and whenever practicable, carefully planned field trips are made to study the species under natural conditions. In this way the student is brought into the closest appreciation of our daily problems.

The courses offered are mainly practical, and are intended to develop an ability for original work. Course 1, gives a general survey of the characters of insects, dealing with their structures, classification, and general methods of control. Course 2, is largely classification of specimens from the various orders of insects, enabling the student to determine specimens new to him. Course 3 treats the subject especially from the economic aspect, studying the principal injurious species and the methods of con-

trolling them. Course 4 is provided to enable the student of marked ability in entomology to continue his work in the economic field.

Number of Students.

The temporary discontinuance of the department makes it impossible to state definitely the number of students that are to enter. Now that work is resumed, five or six have already expressed a desire for work in entomology. The marked ability shown by students in this department, during the past year, speaks well for future interest and development.

Needs of Division.

The principal needs of the department are furniture and reference books. We are practically without cases in which to store and preserve our growing collections. An expenditure of about $500 would fit the rooms up with very satisfactory cases and tables, and this is urgently desired if the efficiency of the work is not to be handicapped. An equal amount is as badly needed for the purchase of reference books and periodicals, many of which are out of print, and will soon be impossible to secure for our library, except at greatly added expense.

DIVISION OF PHYSICS.

Equipment.

The Division of Physics is well equipped with a considerable number of instruments of the highest precision.

Courses.

Two courses are given to Sophomores, that of the first semester covering Mechanics and Heat, and that of the second semester Sound, Light, Magnetism and Electricity. During the current year these are taken by five students.

A third course, in Electrical Measurements, is offered to Juniors in Electrical Engineering, but has never as yet been required to be given.

Needs.

The division lacks an outfit of elementary apparatus, which, however, will be purchased from its annual allowances for new apparatus.

The lecture room needs a line of gas jets across the back of the room, for laboratory use, the single jet at present provided being inadequate for even the small class now studying.

Meteorology.

The division of Meterology has a full set of U. S. standard meteorological instruments, and a forty-foot observation tower equipped with an anemometer, wind-vane, rain-gauge and sunshine recorder, connected electrically with a quadruple register which automatically registers the wind direction and velocity, rainfall and sunshine with great accuracy, except that the instrument, being unacquainted with Hawaiian "liquid sunshine," will not register sunshine when rain is falling.

New Courses.

A course in elementary meteorology is offered for the first time the second semester of the current year, to be followed by an advanced course during the first semester of the following year.

DIVISION OF ZOOLOGY.

Facilities and Equipment.

The six courses offered in zoology are arranged with especial reference to the natural environment of the College. The mountains, the fields and the seashore are open air laboratories filled with interesting material throughout the year. To the natural environment, use of such extraordinary facilities as the Aquarium, the Bishop Museum and the scientific libraries and collections in the city are added in such a way as to supply the student with a wealth of illustrative material. The equipment of the College is being added to year by year as the work of the institution develops. The teaching equipment, consisting of microscopes, apparatus, reagents, models, charts, reference books, microscopic slides and other forms of illustrative material, is modern and first class in every respect, so that the student finds at hand everything essential to the securing of a clear insight into the basic facts and important principles of zoology through observation, dissection, and minute study of the more important familiar animal forms, as well as from lectures, the use of a text book and library assignments.

Animals and animal products enter extensively into commerce, and the well known relation existing between many forms of life and the important diseases affecting man and his domestic animals and cultivated plants resulting from these relations, gives the work in zoology a broadly practical turn. The important facts presented in the courses in Invertebrate and Vertebrate Zoology, Oceanography, Ichthyology, field biology, and special research work in Zoology in the College provides the student with a comprehensive view of the animal kingdom with special reference to such subjects as classification, evolution, variation, heredity and ecology, as well as an understanding of the technical application of knowledge to a given biological problem.

Students.

All students in the courses in Agriculture, in Science, and in Household Economics are required to take Zoology. This year the first student to elect special work in Zoology has made a preliminary study of the ecology and distribution of the fresh water mollusks of the genus *Melania*.

Needs.

Stimulated by a paper on "A Marine Biological Laboratory for Hawaii," given by the professor of Zoology, Mr. Allan Herbert offered to build for the College a much needed seaside laboratory at Waikiki, provided a location could be secured by the College in the park adjacent to the Aquarium. Some difficulty has been experienced in securing the desired location and the erection of the building has been seriously delayed. Seaside laboratory facilities, when available, will give the College access to the fascinating world that lies hidden in the ocean. The securing of this laboratory is the most important step forward, now that the department is comfortably housed in four rooms in the new main building. It is hoped that the Legislature will find it possible to provide the College with the site required.

Courses.

In addition to the six courses in Zoology the professor in that department also gives the course in Physiology required of all domestic science students and the course in Geology required of those in the science and engineering courses. The subjects as offered are designed to meet the preparatory needs of the students in the courses mentioned, but the bearing of the

subjects on Zoology in its broadest sense welds the work into the larger view of the history, structure and relation of all animal life.

Further Needs.

The urgent needs of the department are the seaside laboratory, a competent laboratory assistant, and an increase in funds to be devoted to books and the securing of illustrative material from various parts of the earth, and a printing fund to be used in illustrating and publishing the scientific notes and papers growing out of the work of the department. The development of a fish cultural and biological experiment station for the conservation and increase of the aquatic resources of the Territory and the equipment of an experimental aviary as divisions of the work in the department have been repeatedly urged by the professor of Zoology, and it is hoped that this year will see a real beginning made by the Legislature in establishing this most practical side of the subject under consideration.

Respectfully submitted,

Frank T. Dillingham,
Professor of Chemistry.

EXHIBIT 3.

THE DEPARTMENT OF AGRICULTURE.

To the President of the College:

In accordance with your request I present herewith a report of the Department, comprising reports of its several divisions.

Facilities and Equipment.

Lands. The Department of Agriculture of the College of Hawaii is favorably located in Manoa Valley. The soil is fertile, has a good "lay" and is typical of a large area on Oahu. About fifty acres of land have been set aside for the development of the College farm. A third of this area is now devoted to pasture for the dairy herd; about an equal area is under cultivation, and offers excellent facilities for field demonstration, experimentation and field practice for the students. The remaining land, some twenty or more acres, is as yet undeveloped. A stream borders the land on one side, which when properly developed will furnish ample water for irrigation, power and lighting. The campus of the College covers an area about equal to that comprising the farm, the entire College area being ninety acres.

Dairy Division.

Livestock, buildings, inclosures and *furnishings.* The farm buildings at the present consist of a modern dairy barn 34x56 feet of cement and wood construction. This is used as a feeding and milking shed, feed storage, and milk and butter room. Detached from this main building is a small power house and work shop; an 8 H.P. boiler and 5 H.P. steam engine furnish steam and power for the dairy, which is furnished with steam turbine separator, power churn and butter worker, steam turbine Babcock tester, pasteurizer, automatic bottle filler, etc., suitable for efficient work on a small scale. The pasture is divided into a number of paddocks for bulls, calves, quarantined cattle and the dairy herd, together with shelter for the calves. The dairy herd consists of three breeds, comprising select specimens of the Ayrshire, Guernsey and Holstein-Friesian breeds. Including the herd bulls and young stock, the herd now comprises 22 head of pure bred animals, all but the young stock being registered. At a nominal fee the Department supplies the services of the herd bulls to any one whose cows can show a clean bill of health.

Poultry Division.

The poultry yards at present cover approximately an acre. The area is divided into a number of poultry runs to accommodate about 250 laying hens, and an equal number of young stock. Housing for mature stock is provided by four large permanent houses and five portable houses and five modified Philo coops, designed and built, for the most part, by students. The feed and storage room, under which is the incubator cellar, is 12x16 feet. The plant is provided with ample modern appliances for artificial incubation and brooding. Four makes of incubators and brooders, including electrical machines, have been installed within the past two years. All of these are in active use during the hatching season. Five breeds of poultry are maintained. These include the Single Comb White Leghorns, Black Minorcas, White and Barred Plymouth Rocks, and Buff Orpingtons. The breeding pens are made up of choice birds, and through these the Department has been the means of disseminating a better quality of fowl over the Territory, as in the case of providing the services of high type dairy sires. This phase of the Department service cannot be too strongly emphasized, and should be extended to meet the fullest needs of the community.

The present piggery consists of several small paddocks, four grade Berkshire sows and a thoroughbred boar. While having

produced something over fifty head of choice young stock, all of which has been distributed over the Territory to the benefit of all concerned, this enterprise is greatly in need of a permanent up-to-date equipment. The peculiarly favorable conditions for swine raising in this Territory make it urgent that facilities be provided for adequate instruction in this division.

For team work the College farm is provided with an excellent span of mules. A fairly full equipment of agricultural implements and tools is also provided. Unfortunately the housing for this stock and tools is wholly inadequate, and it is hoped that the next Legislature will provide a reasonable appropriation for this and other equipment as set forth under the heading: "Needs of the agricultural department."

Of the arable land now available a large part is under variety tests of staple field crops. Among these may be mentioned an acre seeded to four varieties of alfalfa. These are also being tested under broadcast and drilled seeding; light and heavy seeding; and artificial inoculation with pure cultures. A large variety of other leguminous crops are also being grown for their seed, it being felt that the expensive mill feeds imported from the mainland may be substituted by home grown concentrates such as the soy bean and cow pea. Two varieties of sweet potatoes and a number of sorghums are also being grown as fodder for the dairy herd. In addition eight varieties of sweet potatoes are being grown in a variety test to determine the best for culinary purposes and at the same time to develop pure strains, as great confusion now exists among the Hawaiian varieties.

Probably for the first time in Hawaii, there is being undertaken an extensive experiment in ear-to-row breeding of five leading varieties of field corn. It is believed that Indian corn is destined to become an important field crop for rotation with pineapples and other crops in Hawaii. This work offers an exceptional opportunity for our students in advanced agronomy. Breeding work is also being carried on with the alfalfas and sweet potatoes by advanced students, this course being designated as Agronomy 5 (Crop Improvement). The College facilities and equipment for this work are especially favorable, and practical results of great value to the Territory, as well as of high educational value, are expected to accrue from these field studies.

The Agronomy laboratories devoted to crop and soil work are situated in the basement of the new main college building. They are well equipped with apparatus and specimens for work

in this department. A large collection of laboratory material for instruction in field crops has been acquired, and samples of typical soils are constantly being added.

Each year the Agronomical Division aims to secure a quantity of superior seed stocks of staple crops that are likely to succeed under local conditions. After supplying student needs, surplus stock is distributed among such of the community as may be benefited.

Agricultural education is no exception to the fundamental principle in industrial training, that "we learn to do by doing." In practically all agricultural study worthy of the name, laboratory work forms an essential part. Therefore, our laboratory work is being emphasized in both field and laboratory.

The agricultural library is quite extensive and new volumes are constantly being added with a view to making it as complete as possible. This is of peculiar importance because of our isolated position.

Courses of Study.

The courses in Agriculture are designed to give the student an intimate knowledge of the fundamental principles which underlie agriculture as a science and a profession, and thus to equip the student for effective service either in practical farming, agricultural education, or research work. Broadly considered, agricultural science comprehends a wide range of subjects, and includes something from nearly every department of human learning. Not in the sciences alone should the agricultural student be broadly educated, but also in mathematics, language, history, economics, and business methods. Accordingly, during the first two years the requirements of the course follow closely those laid down for the Course in Science.

The work of the last two years comprises for the most part the study of the subjects that pertain directly to the science and practice of agriculture. These are agronomy, or crop production, including a study of soils, fertilizers, crops and farm management; animal husbandry in its various branches, including the study of breeds of livestock and breeding, animal nutrition and stock feeding, dairying and poultry keeping; and rural engineering and rural economics. Courses in various branches of agricultural technology are now being developed, that of sugar technology, under the Department of Chemistry, being already under way. A course in dairy technology will be offered as soon as a demand arises.

The growing importance of technical training in the conver-

sion of raw materials produced by agriculture into manufactured articles for use in commerce and the arts will doubtless lead the College to offer other courses in agricultural technology. Among those suggested at this time are: cheese making; the production of hams and bacon; the canning industry; the manufacture of vinegar, starch, oils, wax, leather, textiles, etc. Hawaii is already rich in its resources for the development of each of these industries, and it requires merely that men be trained along these lines and be shown their possibilities, that the most will be made of our opportunities.

Methods of Instruction.

The student is brought into close practical contact with his subject. In agronomy he studies, in addition to the standard texts, the soils and crops themselves in both field and laboratory. Samples and specimens are collected, analyzed and classified. Methods of tillage and culture are carefully studied and fully recorded. Soil and crop improvement is given much attention. And the student obtains a good knowledge of both the principles and practices that underlie good farming.

In Animal Husbandry the student studies the breeds of livestock, not alone from standard texts, but by a study of the animals themselves. Occasional visits are made to the better class of Honolulu dairies, and a rule is made to inspect many of the importations of fine cattle imported into the Territory. The principles of breeding, stock-feeding and general livestock management, as well as dairying and poultry keeping are thoroughly studied both from the standpoint of theory and practice. The courses in farm management consist of studies in the methods of local plantation management, and systems of farm management in the United States and other countries. The College farm has been plotted and systems of cropping and stocking have been worked out from various points of view. Record forms and methods of keeping accounts are worked out and practical application made of same. Much attention is given to discussion of subjects in hand, with a view of drawing out the student.

A detailed schedule of the Agricultural Courses is given in the annual catalog of the College. In addition to the regular four years' course leading to the degree of Bachelor of Science in Agriculture, opportunity is offered for taking advanced work leading to the degree of Master of Science in Agriculture.

Correspondence Courses in Agriculture are offered to persons in outlying districts who are unable to attend the regular ses-

sions of the College. There are now offered Courses in Soils and Crops, and in Poultry Husbandry. Instruction in these subjects is given by written lessons, the student returning a written report on each lesson or assignment. The reports are carefully examined and returned to the student with such corrections and explanations as may be of value to the student. This phase of College agricultural instruction appears to meet a real need, some ten students having registered in the two courses offered by the Agricultural Department.

The agricultural students are about to form an agricultural club or seminar for the purpose of furthering the aims of the department. While the number of the students thus far enrolled in the Agricultural Courses is very small, their work on the whole has been of a high order. Increasing numbers are certain to enroll as the facilities and advantages for education and training in these lines become better known. We believe that the near future promises substantial development in this department.

Needs of the Agricultural Department.

The greatest needs of the College farm are suitable farm buildings with equipment for meeting the requirements of instruction and demonstration in applied agriculture. The facilities in some departments as now afforded are not only inadequate, but are an actual disgrace to the College. With the exception of the dairy barn, and poultry houses built in 1909, the farm buildings now in use are the ramshackle horse-barn and wagon shed, and four little shacks which were occupied by the Chinese vegetable gardener at the time the Government turned over the Puahia lands to the College in 1910. The present piggery was built out of half-rotten lumber taken from one of the old Chinese shacks and is in keeping with the rest of the buildings.

The present dairy and poultry equipment, while good as far as it goes, has been outgrown by present requirements, and should be provided with reasonable extension.

Additional arable land will be necessary for the increase in field work. With comparatively small expense, ten acres of additional land could be gotten ready in the Puahia tract, in which our principal field operations are now being carried on. This would place about 20 acres under plow, and provide ample facilities for some time to come.

To make the present area of cultivated land, as well as the proposed additional tract as productive as possible, an adequate water supply should be provided. Owing to the present unset-

tled status of the College water rights, the supply of water for irrigation purposes has been very unsatisfactory. When the proper adjustment of water supply has been effected, a system of permanent ditches, preferably of reinforced concrete, should be constructed, not alone for instruction and demonstration to students, but as a distinct duty to conserve this valuable resource of crop production.

The College farm should be provided with strong boundary fences. At the present time poorly constructed stone walls exist, and with these it is impossible to prevent the occasional ingress of stray animals.

Since much of the success of the farm depends upon the class of employees maintained in its operation, it is essential that the College provide for its employees suitable housing. This should be simple but comfortable and adequate to their needs. It is urgently recommended that a three or four roomed cottage be provided for each of the farm hands whose duties require that he be stationed on the farm.

While of less importance than the above, a small apiary building would enable the Department to establish an apiary to utilize the valuable bee pasturage offered by the College campus, so richly forested with the algaroba. Already inquiry has been made whether such a course is to be given.

A list of our more urgent needs, with estimates of their cost is given below, together with suggestive plans and specifications:

Five workmen's cottages at $400.00	$2000.00
Combined barn, stables, wagon and implement shed	2000.00
Piggery	2500.00
Dairy addition	2000.00
Poultry additions	1600.00
Fencing	1000.00
Clearing 10 acres additional land	1400.00
Concrete conducts for irrigation water	2000.00
Apiary building	500.00
Total	$15,000.00

The above requirements have been carefully gone over with a view to economizing expenditures without seriously hampering the purposes for which the improvements have been planned. The undersigned would welcome criticisms and appreciate sug-

gestions with a view to greater efficiency in his plans for the coming year.

Respectfully submitted,

F. G. Krauss,
Professor of Agronomy.

EXHIBIT 4.

To the President of the College:

In accordance with your request I present herewith a report of the Department, comprising reports of its several divisions.

DEPARTMENT OF HOUSEHOLD ECONOMICS.

Lines of Work.

Under the name of Household Economics are the two branches of Domestic Science and Domestic Art and Design. In the Department of Domestic Science the problems of food, clothing and shelter are given equal consideration and treated both from a scientific and practical point of view. Under the head of Domestic Art and Design the students are instructed in the principles of art and the application of those principles both to the problems of the home and to those of modern industry. The work of these two departments are closely correlated and supplement each other.

After gaining the fundamental principles of the above subjects the students elect the branch in which they wish to become most proficient and receive technical instruction therein. These courses are parallel to similar ones given in colleges on the mainland, and aim, first of all, to prepare the girls for efficient homemakers. However, should they wish to become wage-earners, the students graduating from this course, who have conscientiously performed the work, might become teachers, caterers, dietitians in hospitals, matrons of boarding schools or other institutions, and with a little further technical training dressmakers or milliners, designers, interior decorators, or workers in the artistic crafts.

DIVISION OF DOMESTIC SCIENCE.

Facilities and Equipment.

This Division has for its use at present a cooking laboratory, a dining room, a sewing laboratory, and an office. These are

spacious and well equipped with electricity, gas, cold water, kitchen stoves with glass doors and thermometers, scientific apparatus, illustrative material, dress forms, fitting room, electric iron with pressing board, etc. Desks supplied with sinks, and a complete cooking outfit give opportunity for individual work. The dining room is furnished with all necessities for the correct serving of meals and is used for this purpose.

Special Students.

All college classes are open to special students whose previous preparation is sufficient to carry on the work. Special classes are also formed to meet the needs of those who are not able to enter regular courses. In cooking and sewing these classes have taxed the capacity of the department.

Correspondence Work.

Courses outlining the elements of the theory and practice of cookery, as well as sewing and garment making are given by correspondence. These are planned to meet the needs of those on the other islands and individual attention is given to each pupil.

Courses Offered in Domestic Science.

There are courses given which deal with the selection and preparation of food materials from their raw state to their place on the table. The work is based on a knowledge of chemistry, botany and bacteriology, while attractiveness and variety in serving are duly considered.

There are also courses offered in Housework and Laundering in which the students learn the cleaning and care of a house, the use of labor saving apparatus; the use of simple tools for repairs, the application of paints and varnishes; the principles and processes included in laundry work, the use of washers, mangles, and other apparatus.

In Dietetics is given a review of the history of foodstuffs in the body and methods of determining food requirements by means of dietary studies, physiological and economic considerations affecting the choice of food materials and their place in the diet under normal and abnormal conditions.

Under the head of Personal Hygiene, Home Nursing and Emergencies, the students are taught the care of the individual, in her relation to environment, the transmission of diseases, the care of children, and what to do in emergencies. .

Comprehensive courses in Sewing, Dressmaking, Millinery and Textiles are given. Also each regular student of this department is required to study House Construction, Sanitation and Decoration.

Students.

In the Domestic Science classes during the past biennial period there have been 87 students enrolled. The majority of these are special students who wish to study only one line of work. Many are at the same time teaching in the city. Some are correspondence students on the other islands. All seem very much interested and some good work is being done. Three of the Domestic Science teachers of other schools have attended these classes to continue their studies.

Needs.

The most pressing need of the Domestic Science Department at the present is for more furnishings, lockers, exhibition cases, work tables, etc. The lack of these has been a great handicap to work. There is also an urgent need for an assistant. The work is growing rapidly and is already too large to be handled by one person.

DIVISION OF DOMESTIC ART AND DESIGN.

Facilities and Equipment.

The Division of Domestic Art and Design has at its disposal two well lighted studios (one for the classes in Ceramics and the other for classes in drawing and color), a small room fitted with a kiln for firing purposes, an office and a storeroom for supplies. The equipment consists of a limited collection of casts, drawing models, color chart and wheel, illustrative designs, pottery. oriental brasses, and stereopticon slides on architectural and allied subjects.

Courses Offered.

The courses of instruction in Art and Design are well balanced and thorough. The aim is to emphasize the inter-relation between beauty and utility, to solve practical problems in a fine way. Freehand Drawing is required throughout the Freshman year. The course provides for the study of form and line, covers the principles of freehand perspective, and gives training in memory sketching and composition.

During the Sophomore year a course in Color is required. Instruction is given in the theory or physical relations of color, together with a working knowledge of color terms and characteristics. Color harmony and pictorial composition are considered as well as the subjects of interior decoration and costume design.

The required course in Art History for the Sophomore year embraces the subjects of Architecture, Sculpture and Painting. Commencing with the Egyptian, a careful study is made of the great styles in architecture, historical conditions, structural materials and designs, and the evolution of ornamental forms. The course of instruction in the allied subjects of sculpture and painting gives valuable training in art appreciation.

The use of lantern slides and photographic illustrations throughout the course furnishes opportunity for critical discussion. The work consists of lectures, text-book study, and collateral reading. Each student is required to keep a note book.

In the Junior year an elective course in Ceramic Design and Porcelain Decoration is offered. Problems in design are carefully worked out and applied to suitable porcelain forms. Attention is given to the discussion of various methods of pottery and porcelain making as well as to the application of color, glazes, lustres and metals.

An elective course in design is also offered with special reference to home decoration. The principles of art structure are studied and original designs are applied in wood-block printing, textile stenciling, leather tooling, and metal work.

Students.

The enrollment in the Department of Domestic Art and Design has been, for the biennial period, eighty-seven. Many of these students have carried two or more courses in art throughout the year and have passed creditably terminal examinations. Teachers of drawing in the schools of the Territory have in several cases taken advantage of the work offered, thereby increasing their efficiency. There is an increasing demand for work in design which touches every phase of life and the outlook for the department is most encouraging.

Needs.

The most pressing needs of the department are:

1. Suitable cases for preserving and exhibiting such work of the students as becomes, for a period of two years, the property of the College.

2. An adequate collection of Casts for use in the drawing course.

3. Easels for both indoor and out of door work.

4. A laboratory equipment for those students who wish to specialize in the artistic and practical crafts.

Respectfully submitted,

FLORENCE M. LEE,
Assistant Professor Household Economics.

EXHIBIT 5.

DEPARTMENT OF ENGINEERING.

To the President of the College:

Sir: I have the honor to submit the following report for the Department of Engineering for the biennial period 1911-13.

The general prosperity of the biennial period just closing has been fully shared by the Department of Engineering. The number of students in all courses has increased materially and the grade of work accomplished has improved.

The Engineering staff has been increased by the addition of an Instructor in shop work, which was made necessary by the larger number of students registering for these and advanced courses.

The first half of the period was spent at the old building on Young street which was much overcrowded, it being necessary to use one room for both drafting and lectures, while the shop and laboratory space was not sufficient for the proper accommodation of the various lines of work. The present year finds the Department in more commodious quarters which give ample space for all drafting and lecture rooms without interference by the different classes, while the shops are housed in a temporary building which is ample for the present.

The first graduate in Engineering received his degree June, 1912, and immediately accepted a position of responsibility with every prospect of success. It is appreciated that the future of the work in Engineering at this institution depends to a large extent on the ability of the men graduated, and it is gratifying to note the work done thus far has been successful, and that the promise of succeeding classes is good.

In addition to the regular courses of instruction in the Experimental laboratory, much work has been done along lines of investigation and research for private interests and various branches of the Government service, among which may be mentioned The Hawaiian Development Company, Limited, tests on ohia lehua; The Honolulu Lava Brick Company, Limited, investigation of brick and pipe of local manufacture; U. S. Navy Engineers, tests of Pearl Harbor Drydock concrete; Department of Public Works, tests on sand, rock, timber and fuels; U. S. Geological Survey, (Water Resources branch), Calibration of instruments and cooperation in stream measurements; Bureau of Agriculture and Forestry, tests of eucalyptus (still in progress); H. S. P. A. Experiment Station, tests on volume occupied by bagasse at various pressures; also many other investigations and tests of a minor nature. While not making the work of instruction subservient to research, it has been the aim of the Department to cooperate with and render assistance to any one in need of Engineering laboratory facilities.

Much interest is being shown at the present time in road construction, and road engineers are becoming more and more convinced of the necessity of tests on materials to be used for road metals. Up to the present the Department has had no facilities for such testing, but a few of the most essential machines for this work are now on order, and it is the intention to extend the equipment as money becomes available.

One of the most pressing needs of the Department is a suitable building in which to house the Engineering laboratory equipment. A building to meet this need, providing proper fondations for machinery can be built for approximately five thousand dollars.

The work in surveying should be amplified by the addition of at least four weeks camp and survey work in order that the men may be made familiar with routine field duties on extended areas, which cannot be done satisfactorily intermittently.

Respectfully submitted,

John M. Young,
Professor of Engineering.

STAR-BULLETIN PRINT
MERCHANT STREET

College of Hawaii Publications

COLLEGE RECORDS *NUMBER 12*

COLLEGE OF HAWAII

REPORT OF

BOARD OF REGENTS

TO THE

LEGISLATURE OF 1915

HONOLULU
PUBLISHED BY THE COLLEGE
MARCH 1915

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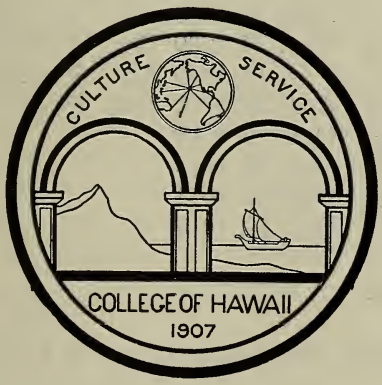
TO THE

LEGISLATURE OF 1915



HONOLULU
PUBLISHED BY THE COLLEGE
MARCH 1915

BOARD OF REGENTS OF THE COLLEGE OF HAWAII.

	Date of Appointment and Reappointment	Date of Resignation	Present Term Expires
Henry E. Cooper	May 1, 1907		
	Apr. 30, 1908		
	May 1, 1912	May 1, 1914	
C. F. Eckart	May 1, 1907	Aug. 24, 1907	
Marston Campbell	May 1, 1907	Apr. 30, 1909*	
Walter G. Smith	May 1, 1907	Sept. 21, 1909	
Alonzo Gartley	May 1, 1907		
	Apr. 30, 1910		Apr. 30, 1915
Ralph S. Hosmer	Sept. 10, 1907		
	June 1, 1909		
	May 16, 1913	Aug. 20, 1914	
Geo. W. Woodruff	Nov. 4, 1909	Dec. 20, 1909	
C. M. Cooke, Jr.	Nov. 13, 1909	Apr. 30, 1914*	
Arthur A. Wilder	Apr. 30, 1910	June 27, 1910	
C. R. Hemenway	Oct. 6, 1910		Apr. 30, 1916
W. R. Farrington	May 21, 1914		Apr. 30, 1917
Mrs. J. R. Ashford	May 21, 1914		Apr. 30, 1919
F. L. Waldron	Oct. 19, 1914		Apr. 30, 1918

* Term expired.

PRESENT ORGANIZATION OF THE BOARD.

Wallace R. Farrington .....Chairman

Alonzo Gartley C. R. Hemenway Mrs. J. R. Ashford

F. L. Waldron

Arthur L. Dean, Secretary.

Report of the College of Hawaii

To the Legislature of the Territory of Hawaii:

In compliance with Act 24 of the Session Laws of 1907, the Board of Regents of the College of Hawaii hereby transmits the report of the President of the Faculty, showing financial statement and exhibits, together with the recommendations for appropriations for the coming biennial period.

In presenting this report we respectfully call attention to what are deemed salient features of the College status.

The College of Hawaii was established to give the young men and women of this Territory an opportunity for advanced education in agricultural science, engineering, and the domestic arts.

THE OPPORTUNITY.

This opportunity the young men and women of Hawaii had not previously enjoyed. College training was open only to those who were financially able to take a four years' course in some mainland college or university.

During the seven years of its existence, the college has passed through the stages of nearly every pioneer institution, and it has had especially to meet not a few of the issues which were met and presumably solved by colleges of agriculture and mechanic arts thirty and forty years ago when these institutions were in the infancy of development on the mainland.

THE CRITICAL YEAR.

Undoubtedly the most critical period in the history of this institution was the college year of 1913-1914. For twelve months the college was without a President, the duties of that office being performed by the Acting-Dean, who had no desire to fill the position, and although doing his task with conscientious loyalty, was saddled with the work of two men and lived in daily expectation that he would be relieved. It will be readily understood that this allowed of no initiative. A drifting policy could only result. The fact that the college did not go backward is due to the splendid loyalty of the Acting Dean and

faculty, and the active interest of the Regents and their unfailing confidence in the future. In addition to the inability of the Regents to make an early selection for the office of President, the sudden change in Territorial finances caused a complete overthrow of plans for development. Appropriations necessary to the physical rounding out of the engineering and agricultural departments were not available on account of the enforced Territorial policy of retrenchment. The prospect was altogether discouraging. The condition was the result of a combination of circumstances, not the fault of anyone.

THE PRESIDENT.

President Arthur L. Dean from the staff of Sheffield Scientific School of Yale University accepted the Presidency, taking office at the opening of the 1914-1915 college year. Mr. Dean had immediately to do a great amount of readjusting to fit the working operations to the funds available. The financial problem was greatly aggravated by an overdraft from the year previous on the prorata of Territorial appropriation for general running expenses. Mr. Dean turned to the task in a manner that shows him to be possessed of high grade business common sense as well as keen educational acumen in sizing up in what manner this college will best serve the young men and women of the Territory and thus satisfy the national ideal of which the college is the representative in Hawaii.

THE OLD PROBLEM.

The attitude of some of our people towards the College is remarkably similar to the position taken in many States and Territories towards these endowed colleges of agriculture and mechanic arts forty years ago. This has made the situation at times rather discouraging because those associated with the College have apparently had to do over again that which the mainland leaders supposed settled years ago.

THE SUPPLY.

The increasing percentage of children who are entering and graduating from the High Schools of the Territory leaves no doubt in the minds of clear thinking and far seeing citizens of

the wisdom of the men who legislated for the establishment of the College of Hawaii. Like all colleges of this character and, indeed, all new educational institutions, the college in its early days has had a small number of students. The habit of going to the mainland for higher education is established by the custom of fifty years and the boys and girls whose financial resources would not allow them to think of further studies have not always been alive to their opportunities. This is a situation which is rapidly being corrected. The following statistics show that there will be a steady increasing demand for advanced education:

Enrollment in Grade VIII, and Public Secondary Schools. 1906-14.

	1906	1908	1910	1912	1914
Grade VIII	147	222	264	339	540
High School	187	248	254	305	457
Normal School	109	134	136	165	144

N. B. The total under High School includes Honolulu, Hilo, Kauai and Maui High Schools.

Table of increase in Grade VIII, and High Schools 1910-12 and 1912-14.

	1910	1912	1914	1910-12	1912-14
Grade VIII	264	339	540	28.4%	59.2%
High School	254	305	457	20.0%	49.8%

Graduates of Public High Schools (Honolulu and Hilo) 1909-14.

Honolulu	19	27	36	29	26	36
Hilo	7	4	2	6	6	5
Totals	26	31	38	35	32	41

N. B. Punahou catalogue of 1913-14 shows an enrollment as follows: Seniors, 44; Juniors, 45; Sophomores, 44; Freshmen, 83. Selected pupils of Mills School and St. Louis College do work of High School rank.

In 1910-12, the increase in enrollment in public high schools was only 20%, in 1912-14, the increase was 49.8% and the in-

crease in the number of graduates for the same time was from 31 in 1910 to 41 in 1914.

Certainly no one can dispute the great importance to the Territory of providing higher educational opportunities for the increasing number of graduates from the secondary schools.

THE AGRICULTURAL COURSE.

The agricultural course has been a real problem. It has been assumed that the moral obligation of any institution endowed by funds of the Federal government should be to lead the student toward "small farm" agriculture and away from the main corporation-controlled sugar industry of the Territory. Consequently there was, in the earlier days, indifference toward the sugar chemistry course, and special attention given to what might be termed a diversified agriculture course.

THE POLICY.

The policy of the present President and Board of Regents is so to shape the courses of study that the college shall serve the Territory in advanced education by enabling the students to earn a living. We aim to educate men for present industrial opportunities as well as to inspire and equip men for new and less tried fields of endeavor.

THE SUGAR COURSE.

A college must "find itself." Hawaii ought to have more of its own home-educated young men in the main industry and the College of Hawaii is furnishing the opportunity to supply the trained men who are now brought from abroad. Furthermore it is a matter of very few years when the exceptional advantages which this college furnishes to students engaged in any branch of sugar production will become more generally known to mainland students, and draw a good number from that source. Louisiana is about the only State where the college of agriculture and mechanic arts specializes in sugar. It is generally admitted that Hawaii offers the best field for the student of cane sugar production. The engineering courses, having been standardized, present fewer unsettled local problems; engineering does not furnish such a frequent topic for discussion as

agriculture. The College of Hawaii not only furnishes exceptionally good engineering courses, but the large enterprises undertaken in the islands bring the students in close touch with the practical field work in civil and mechanical engineering. This is of inestimable value.

THE HOME SCIENCES.

The courses in Domestic Science have been generally successful and the general scheme of the college at the present time furnishes the youth of the islands with a well rounded program for higher education in its application to the practical affairs of life.

THE NEEDED MONEY.

The College of Hawaii should have adequate financial support from the Territory to enable the faculty to carry it forward in keeping with the National ideal that is back of the very liberal Federal endowment.

The College needs money for the improvement of its grounds. The present condition, due solely to lack of funds, is disgraceful. Money is needed for buildings properly to house valuable equipment, much of which has been furnished by the Federal government. Money is needed to provide a course in governmental and business administration. In a word, the College requires a continuation of the legislative wisdom which provided the permanent administration building and large grounds. It needs enough money properly to continue and develop the educational project well begun.

THE WORKING FORCE.

The College of Hawaii has been especially fortunate in the high character of the men and women of its faculty. They have been loyal to the ideals of the institution, faithful in their duties and constitute a working staff that is a credit to American education and of notable value to the Territory.

Provided with the funds necessary for a steady growth, the College of Hawaii is certain to be the representative in this outpost of the Pacific of educational activities and development as

marked and successful in meeting the new issues of the Pacific, as the Islands themselves have been notable in dealing with problems arising from this "melting pot" of races whose people under American leadership are entering upon a new and unexampled era of education and world events.

Respectfully submitted,

WALLACE R. FARRINGTON,
Chairman Board of Regents

President's Report

To the Board of Regents of the College of Hawaii:

I have the honor to submit the following report of the College Hawaii for the biennial period January 1, 1913 to December 31, 1914:

PLANT AND EQUIPMENT.

Lands.

There has been no increase in the area of the College lands during the past two years. A notable improvement has been effected by an exchange of land with the Mid-Pacific Institute, whereby the old and very irregular boundary between the two institutions has been straightened by an exchange of equivalent areas.

Negotiations are pending looking to the acquisition by the College of a small tract belonging to W. E. Wall which is almost surrounded by our land except on the side toward the Manoa Stream. The property carries valuable water rights which will prove of substantial use in the development of the College Farm.

A portion of the land set aside for the Farm has been cleared and is under cultivation; another portion is used for pasture. A very considerable area, however, has remained undeveloped, over-grown with weeds, cactus and bushes, and more or less covered by rocks. The Territory has not provided funds for the proper clearing of this land, and its present condition is a continual eyesore and a reproach. The land should be cleared, fenced, and put to the best agricultural use to which it is adapted. Once put into condition, it will be required to yield at least sufficient revenue to pay for its maintenance. Its present neglect is not good education, agriculture, nor economy.

Roads.

The College grounds are entered from Manoa Valley through Maile Way, and from the Punahou and Moiliili districts through Metcalf Street. The most direct connection from

Manoa to Moiliili, Waikiki and Kaimuki is by way of Maile Way and Metcalf Streets through the College Campus. These roads have been in wretched condition so that the approach to the College from either direction has been difficult. Some temporary relief has been secured by the application, by the City and County of Honolulu, of some gravel, followed by rolling. The Engineering Department of the College has proposed a change in the streets, which has been approved by the Regents, whereby Metcalf Street and Maile Way are united by an easy curve, in place of the present angle, and brought nearer to the main building of the College. The public roads lying within the boundaries of the College are included in the "Manoa Improvement District" and in the event of the paving of this District, under the provision of the Frontage Tax legislation the College will be called upon to pay its share.

In addition to the public streets the College must maintain a private road from the public road to the farm, with branches to the various buildings and fields. Maps for this layout have been made, but in the absence of funds no realization of the plans has been possible. The present approaches are the perpetuation of old paths, and during the rainy seasons they are impassable to automobiles and trucks, and waded through by teams only with great difficulty. These were not called the "pili-pili" lands for nothing. Any proper development of agricultural work cannot be expected without the essentials of decent living.

Professor Keller has developed a plan for an experimental road which would solve the problem of the College roads, and at the same time yield information worth many times the cost of the work. An outline of the plan is set forth in the following letter:

"December 16, 1914.

"Dr. Arthur L. Dean,
"President, College of Hawaii,
"Honolulu.

"Dear Sir:

"In accordance with your recent verbal request, I beg to submit the following tentative plan for an experimental road.

"Much money is being spent today in road improvement, but after the roads have been completed, accurate data are not kept in regard to life, cost and frequency of repairs, condition of the

surface under various weather conditions and much other data which, if properly recorded, could be used to great advantage when future road improvements were planned. The officers charged with road repair and improvements are not in a position to give their time to gathering such statistics. In many states, the college has become the gatherer and disburser of such data and the College of Hawaii is the natural source of such information in the Territory.

"In order to secure reliable data as outlined above sufficient money should be appropriated to lay on the College grounds at least 3000 feet of experimental road, consisting of sections each 300 feet long built of types of pavement most interesting locally, some of which are as follows: Brick, wood block, sheet asphalt, bitulithic, asphalt macadam (penetration and mixing method), macadam (water bound), macadam treated with oil as a dust preventative, gravel, earth (to be kept in shape by means of regular dragging), concrete, concrete with bituminous surface, tar macadam, bituminous concrete, and any other type which might be considered advisable to investigate.

"The appropriation should cover funds for the laying of above pavements and a small amount for maintenance. Arrangements could undoubtedly be made with the City and County Engineer for the use of such road department equipment as might be needed. Probably the manufacturers might donate some of the materials when the use to which they would be put was explained to them.

"The recording and tabulation of the data would be done by the advanced students in civil engineering, under the guidance of an instructor, the road thus serving the purpose of instruction as well as usefulness. Accurate data as to weather conditions, exact locations of all signs of wear, etc., would be recorded.

"The College of Hawaii has some of the required laboratory apparatus for testing road materials and should be in a position completely to finish this section of its materials laboratory so as to test each and every material used in this experimental road. The required apparatus will cost about $900 f. o. b. Honolulu. The original laboratory as planned to house this apparatus, as well the electrical and other machines now inadequately cared for, can be built for $2500.

"In order to extend the experiment a section of road in the City of Honolulu should be assigned to the College by the City Engineer and another experimental road built there. Comparisons between traffic conditions and other factors of wear can thus be obtained.

"Work of this nature has been started on the mainland. Near Columbus, Ohio, 17 sections, each 400 feet long, have been constructed. At Ithaca, N. Y., on the Forest Home Road, 16 sections, varying from 35 to 500 feet, have been laid. Along Connecticut Avenue, Washington, D. C., and continuing on to Chevy Chase, Maryland, a number of sections of various kinds have been laid and also a series of experiments upon surface treatment of water bound macadam inaugurated. In the grounds of the Agricultural Department, at Washington, D. C., surface treatment experiments are being made. The Rockville Pike in Montgomery County, Maryland, has been resurfaced with limestone macadam—the surface treated with various bituminous materials in conjunction with trap rock screenings, gravel and limestone screenings, the experiment being conducted to determine the best method of maintaining macadam roads free from dust.

"I would suggest that if this scheme is feasible a committee of three engineers consisting of the Superintendent of Public Works, the City and County Engineer of Honolulu and professor in charge of the Engineering Department of the College of Hawaii be placed in charge of the general plan, and that the county engineers of the other counties be invited to offer suggestions, or send any materials which they might like to have used in this road. The Civil Engineering Division of the College of Hawaii should carry out the details and have charge of the construction, maintenance and recording of data.

"In order to begin work of this nature, an appropriation of, at least, $5000 would be required. A larger appropriation would enable the investigation to cover more materials, and the sooner information of this nature is available, the more money can be saved in road building.

"Very sincerely,

(Signed) "ARTHUR R. KELLER,
"Professor of Civil Engineering."

Buildings.

The last Legislature appropriated $3000 for "New Buildings, Grading and Other Improvements." Of this amount, $110.55 was expended, and then at the request of Governor Pinkham, no further call was made on these funds except that with the special sanction of the Governor $495 was expended on the installation of a system of urgently needed drains around the main building of the College. The balance of the appropriation amounting to $2394.45 is still in the Treasury.

The Conservation Board allotted $9000 to the College for new farm buildings. Three cottages for farm workmen were built at a total cost of $1675.81, thereby replacing the hovels formerly occupied by the men; and a shed for sheltering the farm tools, machinery and mules was constructed at a cost of $500. The remaining $6824.19 of the allotment were withdrawn because of the financial stringency then existent.

Recently some much needed repairs were made to the Dairy Building, putting it in a more sanitary condition.

Library.

The Library of the College is steadily growing, both from the purchase of new books and current periodicals and the accumulation of the publications of the United States Government and the State Experiment Stations. It has been necessary to put new shelving in the Library room to accommodate the increase, and the space for reading and study is curtailed to such an extent that another room has had to be converted into a reading and study room. The Library now contains 11,303 bound volumes and 12,878 pamphlets. If we assume an average value of $2 per volume for the books and 20 cents for each pamphlet, —which are very conservative values,—the cash value of the Library should be reckoned at $22,863.56 to which not less than $2500 should be added as a value of the card catalog.

We are very far from being able adequately to make use of the material in the Library because of the fact that a large number of scientific journals have remained unbound, and the valuable pamphlets are not properly filed. There is an imperative demand for binding. It is certainly an extraordinary situation to find in the Library a set of books valued at $1500, a work of which there are not over a half dozen sets in the whole United

States, unbound, wrapped in a number of paper parcels, and stored in a basement room. Material for 450 volumes now awaits, and urgently needs, binding. Our accumulations requiring binding amount to about 100 volumes per year. The appropriation by this Legislature should provide funds for binding of 650 volumes.

We should probably not be justified in attempting to bind the bulletins of the State Agricultural Experiment Stations, but we should file them in proper filing boxes, so that they may be readily consulted. About 400 such cases, costing $100, are required to provide for the present accumulation and the increase of the next two years. Other necessary Library equipment and supplies, not chargeable to any departmental accounts, could be held to $150 for the next two years, so that if the binding be estimated at $750, it would appear that the immediate demands could be met with an allotment of $1000.

Equipment for Teaching.

Few persons in the Territory are acquainted with the extent and variety of the equipment which the College possesses for teaching the various branches of science. In many lines it compares favorably with that of the oldest and best institutions on the mainland of the United States. Although from an educational view point the cash value of the equipment is immaterial as long as it serves its purpose for instruction, yet the following summary of the value of the apparatus, illustrative material, etc., may prove interesting:

Agriculture	$ 8,703.66
Engineering	32,969.66
Dom. Art and Science	2,019.12
Botany and Bacteriology	18,919.06
Zoology	3,020.86
Chemistry and Sugar Technology	5,990.87
Physics	2,763.34
Mathematics and Astronomy	3,688.31
Entomology	5,970.77
Photographic equipment	930.82
Physiology	147.58
Geology	180.51
Psychology	110.31

The total value of the property of the College may be summarizezd as follows:

Lands	$100,000.00
Buildings	74,670.00
Furniture	2,225.00
Library	25,364.00
Teaching equipment	85,415.00
Total	$287,674.00

INSTRUCTION AND RESEARCH.

Students.

The greatest need of the College of Hawaii today is a larger number of properly prepared students. We have the facilities for instruction, and an active and capable faculty, and a local demand for trained graduates, especially in sugar technology. As these facts become more widely appreciated, the attendance is certain to increase. It is unfortunate for their own interests that more young men and women have not heretofore appreciated the opportunities offered by the College. The following tabular statement shows the attendance during the last two academic years.

Regular Students.

Year	Freshmen	Sophomores	Juniors	Seniors	Graduate	Special	Extension	Correspond'ce
1913-14	11	7	4	2	4	29	64	20
1914-15	14	3	2	2	3	37	44	..

The standard of work required of the regular students at the College of Hawaii has always been high, and the work done here has been accepted by mainland colleges and universities as the equivalent of their own. The standard of work required of special and extension students has been rising, and after this year all students attending classes at the College whether regular or special will be held to the regular standard of college work. It is probable that for some time to come there will be a substantial proportion of those students who do not carry a regular program of study and are not working for a degree, but whatever work they do take will be of the same character and grade

as that required of regular students. It is expected that special courses of extension lectures and the like will be given from time to time, but it is to be clearly understood that those who take advantage of such privileges are not students doing college work.

Degrees Conferred.

In June, 1913, the following degrees were granted:
To Lilian Boyd, Bachelor of Science.
To Valentine Marcallino, Bachelor of Science.
To William Meinecke, Bachelor of Science in Agriculture.
To Edward Roberts Tracy, Bachelor of Science in Engineering.
To Seigei Yogi, Bachelor of Science.
In June, 1914, the following degrees were granted:
To Alfred Warren, A. B., Master of Science.
To George Harold William Barnhart, Bachelor of Science in Civil Engineering.
To Miriam Clark, Bachelor of Science in Household Economics.
To Paul George Louis Lemke, Bachelor of Science in Civil Engineering.

Courses of Study.

The courses of study offered by the College have been subjected to close scrutiny during the first semester of this academic year. The courses in Agriculture, Civil Engineering and Mechanical Engineering have been changed only in minor details. The course offered in Electrical Engineering has been dropped because there appeared to be no demand for the course here, and because the College was really unprepared to give it without going to a disproportionately large expenditure. The "Course in Science" was open to the criticism that it was rather narrowly confined to chemical studies, and did not allow opportunities for students to pursue work in the more advanced lines of other branches of science, a regrettable condition in view of the excellent opportunities afforded for advanced work in botany, entomology and zoology. In its old form the course in "Household Economics" had not proved attractive to young women students here in Hawaii. It was thought that a combination of the courses in science and household economics might be effected

with good results. Consequently these two courses were abolished and a new "Course in General Science" substituted. In this course there are a certain number of required studies and the balance of the work required for the bachelor's degree is elective. The sciences are divided into three groups: A.—Physical and Chemical Sciences; B.—Biological Sciences; and C.—Domestic Arts and Sciences, and it is required that each student shall elect one of these groups as his major group and choose at least 60 per cent of his elective work from the major group. This ensures that the graduate from the General Science Course shall have a good grasp of some group of sciences, and a wide general knowledge of a considerable range of subjects.

Perhaps the most notable change is the organization of the work in sugar technology. The growing of sugar cane and the manufacture of sugar constitute by far the largest industry in this Territory and it is in the sugar industry that there is the largest demand for trained men. It is readily apparent that a student cannot acquire a thorough training in all phases of the work of the plantation, mill, and chemical laboratory in four years. The Course in Sugar Technology is therefore organized with two Divisions; Agricultural and Engineering. In either division the student receives a good training in chemistry so that he thoroughly understands the chemical features of sugar manufacturing and is fitted to enter the laboratory as an assistant chemist. In addition to this, in the Agricultural Division he is trained in the branches directly concerned with cane culture,—botany, soils and crops, plant breeding, entomology and the like, whereas in the Engineering Division he specializes in the phases of engineering which will lay a foundation on which to build a practical knowledge of sugar mill engineering. In both Divisions the student is required to spend some time on the plantation and in the mill under the supervision of the professor of sugar technology, to the end that he may connect up theory and practice to some extent while still under the guidance of the College.

It is confidently expected that the work in sugar technology will see a rapid and notable development since there is no place in the United States, with the exception of the University of Louisiana, that an opportunity for training in cane sugar growing and manufacture is offered which is at all comparable to that at the College of Hawaii.

Research Work.

The carrying out of original investigations is clearly recognized as an important function of the modern college. It is not sufficient that college instructors should present to their undergraduate students the subject matter of text and reference books. Furthermore, with mature students, especially graduate students working for advanced degrees, original investigations form an essential part of instruction.

One of the most accurate measures of the strength of any college is the published research work.

It is of fundamental importance to the College of Hawaii that the substantial pieces of original work done by the members of the Faculty and the advanced students should be published as college publications. Already several bulletins of merit have been published and we now have on hand material for a number of bulletins which we have been unable to publish through lack of funds. Much of this work will have to be published elsewhere in the event that the College is crippled by lack of funds. This would be a serious loss to the College, since in many cases the connection of the College with the work would escape any general notice and any results of local interest or application could not be distributed here, but would be hidden away in more or less inaccessible journals. Not less than $500 per year should be available for college publications.

Agriculture.

Instruction in agriculture at the Colleges on the mainland of the United States has been reduced to a fairly uniform practice. Such variation as exists is due to the somewhat varying conditions of farm practice in different sections. If the same system of instruction be applied in Hawaii, we find ourselves in the anomalous situation of teaching general farming in a country where general farming does not exist. It is immaterial from the point of view of instruction whether we ascribe the failures of the past to agricultural, economic, racial or any other reason, the fact remains that there is no recognizable system of good practice in which students may be instructed. Profitable agriculture, except for Orientals, has been plantation agriculture, which up to the present has demonstrated that organization is

as much in the line of economic progress in agriculture as in business. On the other hand there are many who believe that thorough Americanization and economic stability require diversified agriculture and the independent farmer.

Under these circumstances the program for the College of Hawaii seems clear: we must teach the fundamentals of agriculture which apply universally without reference to economics or systems of agricultural practice. Thus, knowledge of the chemistry and physics of soils, the nutrition and growth of plants and animals, the control of insects and diseases, is essential wherever the student is to apply his knowledge to agricultural problems. On the sugar plantations of Hawaii these fundamentals have been applied with extraordinary effectiveness, and this application should be studied by the student. How to apply them to profitable diversified farming has yet to be learned. Together with the Experiment Station, the College should labor to develop this successful diversified practice, and any cooperation which will lead toward this end should be encouraged, and any working at cross purposes must be condemned. The first task to which the College has addressed itself is that of demonstrating whether or not it is feasible, and profitable, to feed dairy cattle and swine from the produce of the soil under Hawaiian conditions. If it can be done successfully we want to know how; if it cannot we want to know why. These are first steps toward the answer to the question,—shall we produce our own food, or shall we import it?

That some progress has been made in spite of adverse conditions is well known to those who have followed the work of Professor Krauss with forage crops. All the forage consumed by the enlarged College herds is now grown on the College Farm,—alfalfa, Uba cane, sorghum, cowpeas, and other grasses and legumes. The improved quality and higher yields of these and other crops grown on the College Farm are due in large measure to the work in plant breeding carried on by Professor Krauss and his students.

The College has given special attention to dairy herds and the swine. The dairy herd now comprises twenty-six head of thorobred stock divided among the Holstein, Ayrshire and Guernsey breeds. This number includes a registered bull of high quality in each breed. The dairy herd is becoming more and

more efficient. The record of 12,085 pounds of milk, with a butter equivalent of 507.59 pounds in one year is a record that should prove a valuable object lesson to local dairymen. The production of a number of the College Farm raised animals, as distinguished from imported stock, is very creditable and shows that a good class of milch cows can be produced under local conditions.

The College has made an entirely new start with swine. The old herd contained only grade Berkshire sows, and the housing and yards were neither adequate nor sanitary. Large yards have been enclosed by wire fencing, the old animals sold and new registered stock of two breeds selected last summer by Mr. Clark from some of the best herds in California. We now have a very fine Berkshire boar and two sows (a third which was selected last summer will be shipped soon) and a Tamworth boar and three sows. The sale of pigs from these animals cannot fail to have a far-reaching influence on the quality of swine on Oahu. Because of the quarantine they cannot be shipped to the other islands.

In addition to the breeding work it is very desirable to conduct careful quantitative experiments on the growth and fattening of pigs with various kinds of feeds, both those purchased and those grown on the College Farm. These experiments would show just how much it costs to produce a pound of pork by the different methods of feeding, and throw much light on the question of how far we can go toward producing the pork products consumed here. The curing of hams and bacon should be carefully tried out to determine its practicability. A piggery building will be necessary for this line of work.

The old poultry plant was located at a considerable distance from the parts of the farm frequented by the men. Cats, dogs, rats, and small boys made serious inroads, and it seems wise to relocate the poultry where they will be near the homes of the workmen and in full view.

Professor F. G. Krauss resigned from the College Faculty, his resignation to take effect at the end of the first half of this academic year. Those who have been in close touch with his work know and appreciate the efficient and faithful services he has rendered, and deeply regret his going. The position which he has occupied is a difficult one to fill, since agriculturists from

the mainland, no matter how well qualified, are seriously handicapped by ignorance of our peculiar Hawaiian conditions. The College and the Territory are fortunate in securing as a sucessor to Mr. Krauss, Mr. Jared G. Smith, whose thorough training and intimate acquaintance with Hawaiian agriculture fit him most admirably for work at the College.

The needs of the Agricultural Department in the order of their importance are: roads, permanent fencing, clearing of land, building for handling milk, piggery building, poultry building and yards, a barn, and concrete irrigation conduits and reservoir.

Horticulture.

The College has in the past attempted to give instruction in horticulture. To do this properly requires extensive plantings and it has not been possible to provide them without a very considerable expenditure. It is extremely doubtful if such expenditure is justified since a large amount of such work is constantly going on at the Federal Experiment Station and any duplication would be wasteful. When there is demand for instruction in horticulture, cooperative arrangements should be made with the Experiment Station to the end that the existing facilities may be made available for purposes of instruction.

The College no longer offers instruction in horticulture on the old basis.

Engineering.

Work in the Engineering Department has proceeded along the lines already established. The time of the professors in this department is largely devoted to instruction, but they have found time to carry on investigations and contribute to a substantial extent to the welfare of the College by their labors in preparing plans and drawings for the development of the institution. The instruction in engineering is of a high order of merit, and there is an excellent opportunity for properly qualified young men to get a good engineering education at the College.

In addition to the regular courses of instruction in Experimental Engineering, work has been done by Professor Young and Professor Keller along the lines of investigation and research for private interests and various branches of the Gov-

ernment Service, among which may be mentioned the following:

Cement tests for Alexander & Baldwin, Ltd.
Kahului Railroad Company,
T. H. Davies & Co., Ltd.,
Ripley & Davies, Architects.

Tests of sand for concrete for Alexander & Baldwin, Ltd.,

Tests of sand for use in water filtration for Maui Agricultural Company,

Continuation of Eucalyptus tests for Board of Agriculture & Forestry (mentioned in previous report),

Tests of cement tile pipe for Honolulu Lava & Brick Co.,

Tests of insulation for Emory & Webb, Architects.,

Rock and stone tests for U. S. Treasury Department, H. L. Kerr, Architect, for Hilo Federal Building.

The U. S. Navy Engineers at Pearl Harbor have continued to use the facilities of the laboratory for the investigation of concrete and concrete materials for use at Pearl Harbor Naval Station. These investigations now cover a period of about four years and when completed will be of great value to all users of local materials for concrete aggregate.

The valuable and public spirited service which Professor Keller has rendered this community without compensation, thru his connection with the Territorial Board of Health should not pass unnoticed.

During the past two years considerable investigation of the sanitary condition of water supplies has been carried on by the Territorial Board of Health. The Hawaiian Commercial & Sugar Company of Maui in order to improve their domestic water supply decided to install slow sand filters. As this is a new field in the Territory preliminary work in the investigation of various sands must be made. The Hawaiian Commercial & Sugar Company under the direction of the Sanitary Engineer of the Board of Health installed an experimental filter at Kobayashi Camp, central Maui. After several months' investigation, this experimental filter had served its purpose at that place. The Hawaiian Commercial & Sugar Company have given the entire experimental plant to the College of Hawaii. This filter is now being set up on the College Grounds and is to be used for instruction purposes as well as for making investigations along similar lines for private parties. The College

of Hawaii is fortunate in receiving such a gift at this opportune time.

Experimental work in engineering requires considerable room and special foundation work, and it is frequently so noisy that it cannot be carried on in a building devoted to recitation and lecture work. A building for experimentation in engineering is needed. At present we have some equipment which cannot be set up because of lack of space and some because its use would cause so much noise in the main building that no class work could go on. Through the kind offices of Hon. Marston Campbell when Superintendent of Public Works of the Territory, the College was given a number of electrical generators formerly used at Nuuanu Power Plant. The College had to remove them from storage in Nuuanu Valley and they now repose between the forges in the Forge Shop, very much in the way and quite unavailable for use. The large testing machine has been placed on a permanent concrete foundation and, to prevent its deterioration, a small and unsightly temporary shed has been placed over it. The plans and specifications for an engineering laboratory building to take care of our equipment have been prepared. The construction of such a building estimated to cost about $3000, is required if laboratory work in engineering is to be developed here. This is the building which has already been mentioned as necessary in connection with the proposed experimental road.

In addition to the use of the building and its equipment for instruction, several lines of investigation in addition to the road work would center there. These investigations require some expenditure of money, at least $500 per year, but the results would be of permanent value to the Territory. Outlines have already been made for the following investigations:

(1) Tests of water-proofing compounds.

(2) Tests of the strength of rocks from various localities on the Islands, indicating their usefulness for building purposes.

(3) Continuation of a study of the sands of these Islands, particularly in respect to their use for concrete aggregate; already started in a small way, but requires funds for securing adequate samples.

It is the custom in the better institutions to supplement the

work in surveying by summer work on a larger and more practical scale. The Engineering Department has under consideration a plan whereby the students may carry on work of this character in connection with the survey of unsanitary lands or public lands for the Territory. In the event of such an arrangement being made, a small outlay will be necessary for incidental expenses.

Sugar Technology.

The work in sugar technology was started at the beginning of the second semester of the academic year 1912-13 under the direction of Professor Herbert S. Walker. The work includes thorough training in the chemistry of sugar making as well as instruction in the theory and practice of the various manufacturing operations. By correlating the work in agriculture, engineering and other sciences which find application in the growing of cane and manufacture of sugar well rounded instruction is now offered.

The equipment of laboratory apparatus is fairly complete and contains practically everything a sugar factory chemist will be required to use.

In addition to the regular courses of instruction, the facilities and equipment of the sugar laboratory are open to responsible persons wishing to do research work in sugar chemistry. The department is at present cooperating with the Hawaiian Chemists' Association in revising their methods of factory control.

Languages.

There has been a gratifying increase in the enrollment in the English classes; in the course in composition, for example, the attendance has increased from 12 in 1912 to 25 in 1914. The importance of this work is especially great here in Hawaii because of the presence of students who come from homes where English is rarely spoken. Although a mastery of idiomatic English presents great difficulties to such students, it is one of the most important functions of the College to assist them to it. By dint of patient effort on the part of students and instructor some of these students have acquired a vocabulary and a power of correct and idiomatic expression superior to those of many

young men born of English speaking parents and educated in the best schools of the Eastern States.

During the past two years two courses have been given especially for extension students. In the second semester of 1912-13, the short story course, which had been given during both semesters of the preceding year, was repeated, with a registration of fifteen. In the second semester of 1913-14 a class numbering fourteen was organized to study the modern drama. Lectures were given on the principles of dramatic structure, and the class read and discussed plays by Shakespeare, Sheridan, Ibsen and Shaw.

Last year some of the young ladies of the College with the assistance of Professor Andrews overcame the many obstacles in their path and gave two successful performances of a play written and staged by themselves. The absence of any auditorium or large lecture room at the College makes such an undertaking especially formidable, and its successful issue worthy of great commendation. Enough money was raised to pay all the indebtedness of the student association and complete the construction of a tennis court.

The policy of adding books of permanent literary value and reference books dealing with literature has been continued, and about 400 volumes have been placed in the library since the last report.

Two hindrances to effective work in German and French were pointed out in the report to the last Legislature: the frequent changing of instructors who were employed for part time only, and to most of whom "the College work was secondary if not incidental;" and the admission to the classes of students who were insufficiently prepared or who failed to do the regular work. We believe that both conditions have been remedied. Fraulein Maria Heuer brings to her position as Instructor in Modern Langauges thorough preparation and whole-souled enthusiasm. After graduating from a private school near Berlin, she entered and later graduated from the College of Neuchatel (Switzerland). In this College all classes are conducted in French. Then three years of teaching French and German in Berlin were followed by two years of study in the College of Modern Languages (Berlin), which gave her a State Certificate as Teacher of Languages. Further study of French followed in

the University of Neuchatel and at the Sorbonne. Then after two years of study and teaching in England, she organized in Berlin a school for the teaching of French and German to foreigners. Without forgetting the value of drill, her methods of teaching are directed to the making of language and literature a vital thing rather than a picking over of the dry bones of grammar. In this way the student may pass through the gateway of a foreign language to a knowledge and appreciation of another people's thought and civilization.

It is now required that all students enrolled in the regular classes shall be prepared to enter them and shall do the full work and pass the examinations.

History and Economics.

The Federal laws appropriating money to the several states for the use of colleges, allow expenditures for "economic science," but not for "political science, civics," or history. At no period has it been particularly easy to point out precisely where economic science ends and political science begins; today with the problems of tariff, state ownership, state control, and the like, it is well-nigh impossible. Neither economics nor government can be intelligently studied without a study of history.

If this College shall stand as one of the notable agencies for the "Americanization" of these Islands, the study of history, government and economics must be an important part of the instruction. One hears the fear expressed that the Islands may become dominated by Oriental influence. This must not happen. In this community we need thoughtful responsible men, thoroly informed regarding the history and institutions of our country and their relation to those of other nations. Those who finish their education at the College of Hawaii should have such knowledge and be American in their sympathies, whether they be of Caucasian or Oriental parentage.

Since much of this instruction cannot be paid for from the Federal appropriation, it is essential that the Territory provide adequate funds for instruction in these lines which bear such a close relation to citizenship. The plans for this work call for courses in American history, including that of Mexico and South America, Modern European history, and ultimately the history of Eastern Asia. The study of government should ac-

company that of history, so that a knowledge may be had of the practical workings of municipal, state and national government in the United States, and to some extent in the most important nations of Europe.

Mathematics and Physics.

A considerable addition has been made to the books and journals dealing with mathematical subjects in the College library. There has been no notable change in the courses of instruction.

The College has, in the past, required physics as an entrance subject. A considerable proportion of intending Freshmen present themselves with no such training, and the instruction in the department of physics has suffered from the variation in the preparation of the students. A new arrangement goes into effect next year whereby all Freshmen who can not satisfy the Committee on Entrance that they have received adequate elementary instruction in physics will be required to take "Special Freshman Physics." The physics of the Sophomore year can presuppose a good elementary training and be of a correspondingly higher grade than in the past. For Juniors in Engineering an advanced course in electrical measurements has been arranged.

Mr. John Cassidy has recently presented the College with more than a dozen remarkably fine instruments,—galvanometers, rheostats, Wheatstone bridges, etc., the outfit of the Hawaiian-Pacific Cable Co., promoted in 1890 by Mr. J. Sherman Bartholomew, which failed after its unsuccessful attempt to establish a cable between Oahu and Molokai. Some of these instruments may need repairs by an expert, but form an important addition to our electrical equipment.

Chemistry.

In the last two years forty-four students have been enrolled in the different courses in chemistry and have made use of the laboratories. The Islands present many interesting problems for chemical investigations and there are facilities in the College laboratories for such work by advanced students. An investigation of the active principle of the Kava or Awa *(Piper methysticum)* is now being carried out by a graduate student and promises to yield interesting results.

Professor Dillingham has published the following articles: "A Proposed Modification of the Kober Method for Quantitative Determination of Ammonia"; "A Discussion of Soil Acidity and of Methods for its Determination"; "A Review of Day and Shepherd's Paper on Water and Volcanic Activity."

New courses in agricultural chemistry, chemistry for engineers, and the composition and utilization of foods are being offered.

The housing of the laboratories of chemistry and sugar technology is a problem which will become pressing within a very short time. As matters now stand the laboratories are crowded into an old wooden structure of flimsy and very inflammable character and the thousands of dollars worth of valuable apparatus are constantly exposed to risk of fire. The number of students in the elementary courses already taxes the capacity of the building. The need of an adequate fire proof laboratory building is great.

Geology.

The course in Geology presupposes some knowledge of zoology, botany, chemistry and physics. Considering the limited number of upper classmen as yet in the College, it has been well received by both regular and special students.

Although the islands furnish rich and abundant material for the study of volcanology and certain phases of dynamic geology, the almost complete absence of the material with which the subjects of stratigraphy, paleontology, and historic geology deal has made it necessary to provide illustrative material in keeping with the broad requirements of the general course from sources outside of the Hawaiian Group.

This lack of material was keenly felt in the earlier years, but happily it has been remedied during the past two years by the purchase of much needed illustrative material including maps, charts, specimens, and models. To specify somewhat in detail; the department is now supplied with small yet satisfactory collections illustrating historical paleontology, the physical properties of minerals, structural and phenomenal geology, general stratigraphy; together with a systematic collection of rocks, an economic series illustrating the more important building stones, marbles and ornamental stones, and a representative collection of coals and coal and oil forming plants and animals.

In addition to the foregoing a fairly complete set of models illustrating physical geology and physiography, faults, valley denudation, displacement of strata, intersection of mineral veins, surface indications of coal strata and the like now renders the teaching equipment for this interesting and important subject reasonably complete and satisfactory.

General Botany.

The instruction in the courses in general botany has proceeded along lines already laid down. The opportunities for botanical study here in Hawaii, both elementary and advanced, are remarkable. Oahu is a great out of door laboratory, and the courses of instruction have been planned to make full use of our unique location. An equable climate, interesting native flora, a bewildering array of introduced plants, and a most striking variation in conditions of soil and rainfall unite to make Hawaii one of the best places in the world for the study of botany.

There is immediate need of funds for the publication of the original work done in this department. Considerable valuable material has been worked up for publication, and its appearance should not be delayed.

Plant Physiology is a fundamental study in agriculture and is now included in the programs of the Course in Agriculture and the Agricultural Division of Sugar Technology. We have a small slat house which should be moved to a position near the main building and provided with water connection and working tables.

Systematic Botany.

The Herbarium, which has been built up through the efforts of Mr. Rock, is one of the most valuable scientific assets of the College. It is now the most complete collection of Hawaiian plants in the world. Its value has been greatly enhanced by the material presented to the College through Mr. Rock at the time of his recent visit to the important herbaria of Europe. A brief account of Mr. Rock's trip may be presented in his own words:

"In September, shortly before the opening of the school term, the writer started on his journey around the world at his own

expense, permission having been given him by the College authorities to carry on investigations in the various Herbaria of Europe. The writer was properly commissioned by the College. He was also commissioned by the Board of Agriculture and Forestry as a scientific explorer for the purpose of collecting seeds and plants which would be of benefit to the Territory with special regard to the reforesting of the upper slopes of Mauna Kea and Haleakala. Another commission was given the writer as collaborator of the Bureau of Plant Industry of the U. S. Department of Agriculture, Washington, D. C., with the instructions to collect, or cause to be collected, seeds of Bamboos of the Himalaya regions, especial those of Sikkim, for the purpose of planting the same along the Panama Canal.

The writer proceeded on the U. S. Transport "Thomas" to Guam and Manila. While in the Philippines the forest regions of Los Banos were searched for seed, and a large amount of seeds of timber trees collected on Mt. Maguiling; Mt. Mariveles in the Batan Province was also ascended in company with members of the Philippine forestry school and seeds collected there.

He then proceeded to Hong Kong and Singapore. In the latter place the writer was the guest of the Director of the Botanic Garden, and a large amount of seed was secured of tropical trees and flowering plants. After paying a short visit to Penang and Burmah the writer sailed for Calcutta, India. Most of his time during his stay in India was spent in the Himalayas with headquarters at Darjeeling, collecting seed of subtropical and temperate forest trees. Seeds of more than 82 species of trees were introduced to Hawaii as new, most of them upland trees, and especially fitted for our high mountains. Arrangements were made to have collected two bushels of seed of a large bamboo (*Dendrocalamus Hamiltonii*) which fruits nearly every year; this bamboo was desired by the Department of Agriculture for experimental plantings along the Panama Canal to present landslides. After the writer had completed his work in these magnificent mountains, he returned to Calcutta visiting the fine Botanic Garden of Sipbur where he made arrangements to have forwarded seeds and rooted layers of the King of flowering trees (*Amherstia nobilis*), the finest flowering tree known. From there he traveled through the whole of north India to Peshawar in the northwest frontier province.

There he secured a pass from the residing political agent allowing him to cross the mountains intervening between British India and Afghanistan by way of the Khyber. Much seed was collected of trees related to our algaroba in this arid region, which undoubtedly will grow well in our dry districts.

From there he journeyed to Bombay, Central India, Hyderabad in the Deccan and via Madura, Tuticorn in South India to Ceylon. From Colombo he immediately went to Kandy, spending most of his time at the world renowned Botanic Garden at Paradenya, collecting seeds.

The writer then embarked at Colombo for Europe via Egypt in which latter place he visited the gardens and agricultural schools at Kairo and traveled as far south as Assuan.

In Italy the writer visited Dr. O. Beccari of Florence and Professor U. Martelli, both of whom have contributed to the knowledge of the Hawaiian Flora.

The writer's main work was to be done at Berlin. He was well received by the authorities of the Royal Botanical Museum at Dahlem, near Berlin, and all possible courtesies and facilities for work were extended to him. As is well known the Berlin Herbarium possesses the best collection of Hawaiian plants outside of the College of Hawaii. It moreover contains Hawaiian material which is priceless. These are the types of Dr. William Hillebrand which were given with his whole collection of Hawaiian plants to the Berlin Museum. The Hawaiian Flora possesses so many polymorphous genera that it was absolutely necessary to compare specimens collected by the writer with the type material in the Berlin Herbarium, and for that purpose eleven packages containing over 1000 sheets of Hawaiian plants of the College of Hawaii Herbarium were forwarded to Berlin.

The writer had at his disposal not only the Hillebrand's collection but also Chamisso's, Gaudichaud's and through the courtesies of Dr. Zahlbruchner of Vienna also Wawra's collection of Hawaiian plants deposited in the Imperial Royal Natural History Museum in Vienna. Three months were spent in working up this material at Berlin which enabled the writer to straighten out many doubtful points and made the Hawaiian Flora appear to him in a different aspect. The most valuable contribution to the College of Hawaii Herbarium was made by the Royal Botanical Museum at Berlin in giving us co-types and portions of

types of Dr. Hillebrand's plants, amounting all in all to nearly a thousand specimens. Among these are many plants which have become extinct in Hawaii since Dr. Hillebrand's residence in these islands.

After paying a visit to Vienna, the writer's old home, he left for the United States. In Cambridge, Mass., he studied the collection of Hawaiian plants at the Gray Herbarium, Harvard University, made by the U. S. Exploring Expedition in the year 1849, by Dr. Pickering. Through the courtesies of the Gray Herbarium, the College of Hawaii has come into the possession of parts of Dr. Asa Gray's type specimens of Hawaiian plants. These with the Hillebrand material make our herbarium of Hawaiian plants the finest in the world.

While at Berlin the writer received for examination the whole collection (type material) of Hawaiian plants (made by Abbe Faurie during 1909 and 1910 in Hawaii), of Professor H. Leveille, of La Mans, France, who rather too eagerly had described over 100 new species from Hawaii, out of which only three proved really to be new. A complete review of H. Leveille's work was published in Berlin by the writer in Fedde's Repertorium.

On August 10th the writer returned to Honolulu and resumed his duties at the College."

The following publications should be noted:

"The Indigenous Trees of Hawaii" by J. F. Rock;

"The Hawaiian Peperomias" by Casimir de Candolle and "Descriptions of New Species of Hawaiian Plants" by J. F. Rock, constituting Bulletin No. 2, College of Hawaii Publications.

Manuscripts on the vegetation of Palmyra Island and the Hawaiian Lobeliaceae are ready for publication and others are in preparation.

The College possesses a very valuable collection of books dealing with the botany of the Hawaiian Islands.

Zoology.

Substantial increase has been made in the facilities for instruction in zoology during the past two years, partly by the purchase of instruments, models, etc., and partly by the addition of a large amount of material collected by Professor Bryan.

Particular mention should be made of the collection of marine animals from the Hawaiian reefs.

The facilities for instruction in zoology at the College, and the opportunities for study provided by nature, unite to make study and research here most attractive. It is hoped that the rearrangement of the programs of study which has been effected will encourage students to specialize in zoology and other of the biological sciences.

In addition to a number of brief articles already published or in manuscript, Professor Bryan has ready for the press his "Natural History of Hawaii," a book of about 600 pages.

Entomology.

The facilities for instruction and research in entomology have received notable additions during the last two years. New working tables for students and cabinets for holding the collections of insects were manufactured in the College shops, and together with new microscopes and other apparatus and a rapidly growing collection of insects render the equipment of the department adequate for both elementary and advanced work. The great importance of applied entomology to the Territory emphasizes the usefulness of this science, and the number of students taking work is increasing.

In June, 1914, the degree of Master of Science was granted to Mr. Alfred Warren, a graduate of Earlham College, for work done in the Department of Entomology. The thesis submitted on "The Food Habits of Hawaiian Dragon Flies" presented the results of important observations on the value of these insects in destroying flies, mosquitoes, etc. During the summer of 1913 Professor Illingworth carried on an extensive investigation of sugar cane insects and the breeding of parasites therefor in the interests of the Colonial Sugar Refining Company in the Fiji Islands. Several papers have already been published giving the results of this work.

With the development of this Department a number of new courses of instruction in entomology are being offered in the new catalog. The opportunities for work here are excellent, and the natural conditions for study due to our surroundings, unexcelled. By an arrangement with Mr. E. C. Smith the Col-

lege will have the use of an apiary of seventy-five to one hundred colonies for purposes of instruction and study.

Domestic Arts and Sciences.

The courses in Art and Design follow a definite sequence. Beginning with free-hand drawing, the student follows this with work in color and design, and in the third year makes application of the work of the two preceding years to the specific task of porcelain decoration. Only the original designs of the students may be applied to the porcelain, and the work bears but little relation to the so-called "China painting" commonly practiced. To round out the instruction in this department, Miss Chipman offers two lecture courses; one on the History of Architecture, and one on the History of Sculpture and Painting. During the years of beginnings at the College a number of extension students were received who were not properly prepared to carry on the work because of the lack of preliminary training. The courses are now all on the basis of regular college work and must be taken in their logical order.

The quality of the work in drawing, design, and ceramic decoration is very high and has drawn favorable comment from competent critics. Of special importance, as an educational factor, was the exhibition held in the art rooms at the close of the year 1913-1914. The work was arranged in order of sequence from the Freshman to the Senior year. In this way the relation of one course to another and the steady development of power in art expression and application was shown. Thus the course in drawing was shown as the basis for all other work in the Department, and studies in charcoal composition, pencil sketching, and freehand perspective, appeared as preparation for color interpretation. In the color exhibit were shown original charts illustrating the laws of color harmony and balance, costume sketches emphasizing the application of these principles to the requirements of costume design, and studies in household decoration. Each student was represented by an original design, in color, of a room interior illustrating the principles of space art. Pieces of porcelain were exhibited showing designs which had been developed by the students and then applied to the ware.

Miss Florence Lee, who has given the instruction in Domestic Science, was obliged to take a year's leave of absence during the present College year because of ill health. Miss Louise Peirson, who was secured as a substitute, has given most efficient service and proven a valuable member of the Faculty. Domestic Science has not been taken by many of the regular students, but the elementary work has attracted women of Honolulu, including many school teachers, who have availed themselves of the opportunities offered. The work given has been mostly on the extension basis. By the rearrangement which becomes effective next year the instruction for all students taking domestic science, whether as special or regular students, will be of the same character. All students will be held to a college standard of work, and by following a sequence of courses the same substantial education will be afforded in the work with textiles and foods as in the courses in art and design. College work must not consist of classes in elementary sewing and cooking, but must include lectures and text book study conforming to an advanced standard. The intention is not to keep students out, but to require a higher standard of work, of advantage to student and College alike.

During the biennial period 61 students have registered in courses in Art and Design and 138 in Domestic Science.

Extension Work.

The regulations under which money is annually appropriated to the College of Hawaii by Congress expressly forbid the use of any of the money for extension or correspondence work, and the Territory of Hawaii has never made any appropriation therefor. The work which has been carried on in the past had been a voluntary contribution on the part of certain members of the Faculty. The last Congress passed the Smith-Lever Bill which appropriated $10,000 to each one of the Land-Grant colleges on the mainland for extension work, and provided for increasing this amount. As the bill passed the House, Hawaii was also included. For some unexplained reason Hawaii was subsequently eliminated, due to strong opposition from some unrevealed source. One half of the above amount, i e., $5,000, was added to the appropriation to the Experiment Station where it might be expended strictly under Federal Control.

As a consequence of this turn of events the College has been wholly unable to carry out the extension work which had been planned for with considerable care.

Several series of lectures and excursions have been given this year on Saturday mornings, especially intended for school teachers, but open to any interested persons.

PLANS AND DEVELOPMENT

Course Preparatory to Business.

The largest demand for educated young men in Hawaii, outside of the sugar industry, appears to be in lines requiring a business training. What is required in such education is not the subjects taught in commercial courses in high schools, but rather that broad fundamental training which assists a man to a grasp of affairs and gives him a knowledge of the underlying principles of accounting, business administration, and commerce.

A tentative program of studies for such a course has been worked out which includes such subjects as commercial geography, economics, accounting, advertising, business organization, money, banking and exchange, commercial law, tariff and customs, government and history. It is believed that the addition of one man to the Faculty would enable us to carry out this program of work. Graduates from such a course would be fitted to enter business or government work or to enter upon the study of law.

About $1000 per year would be added to the Territorial budget by establishing this course.

Agriculture.

The Hatch Act of 1887 and the Adams Act of 1906 provide for the establishment and support, "under the direction of the College or colleges or agricultural department of colleges in each State or Territory established, or which may hereafter be established, in accordance with the provisions of an act approved July second, eighteen hundred and sixty-two, entitled 'An act donating public lands to the several States and Territories which may provide colleges for the benefit of agriculture

and the mechanic arts,' or any of the supplements to said act, a department to be known and designated as an 'agriculture experiment station.'" The legislative assent required by the acts cited has been given by the Legislature of this Territory in behalf of the College of Hawaii which is clearly included within the provisions of the Acts. The College is entitled to receive $30,000 per year for an agricultural experiment station.

We have not applied for these funds, because it was probable that if they were received here, Congress would decline to continue the appropriations for our Federal Experiment Station. Our request for such funds might be regarded as equivalent to saying that the College could run a better experiment station than the one now existant. On the other hand the attempt to carry on research work in agriculture hampered by lack of funds, when we are clearly entitled to $30,000 per year for that purpose, is not a particularly inviting prospect.

When it shall appear to the citizens of this Territory that there will be a gain to the Territory by a union of forces between the Federal Experiment Station and the College of Hawaii, the College is willing to apply for the Hatch and Adams funds and meet the situation by putting into the union its available agricultural assets. Meanwhile it will be the policy of the College to develop instruction, and carry on such research work as our resources will allow.

Arboretum.

There is an unexcelled opportunity to establish here in Honolulu a collection of trees and shrubs of tropical and subtropical habit which would have great educational value and soon become an asset of great interest to resident and tourist alike who would be attracted by such a collection of properly labelled tropical species. Mr. Rock is in a position to supervise such plantings and get seeds and young plants of great variety and interest. Grading, the laying of some water pipe, and the services of two or three men are needed to get this work underway, and the sooner it is started, the more quickly the trees will begin to make a showing.

Sea Side Laboratory and Fish Cultural Station.

Large opportunities for scientific and practical work with marine animals and plants are awaiting development here in

Hawaii. At one time the College was in a position to build a sea side laboratory with funds put at its disposal by an interested citizen of Honolulu. The plans were prepared, but their realization was unfortunately blocked by the opposition met with in attempting to secure a site. The offer of money to build such a laboratory has been withdrawn.

We are spending in Hawaii large sums annually in agricultural experimentation; it is worth while considering the possibilities of marine development. Well informed persons believe that mullet growing is capable of important developments. The pearl oyster apparently exists in the waters between Molokai and Lanai, and sponges could probably be grown here on a commercial scale. The College is in a position to take charge of such work and furnish the expert supervision required. The United States Bureau of Fisheries has been interested in establishing a fish culture experiment station here and if a proper site, at Kaneohe Bay, were provided by the Territory, Federal co-operation might be confidently expected. At this time when Hawaii is taking careful count of stock the possibilities of the sea should by no means be neglected.

Bird Introduction.

The introduction of new insectivorous birds into Hawaii has long been agitated. It is essential that no mistake be made, and no bird set at liberty until its food habits in its natural habitat and in Hawaii are known. The College has available land for the location of large flying cages where new birds could be confined and their habits of feeding, breeding, etc., kept under observation. Under the direction of the professors of zoology and entomology adequate record could be secured, and species which proved desirable liberated. If the Territory wishes work of this kind carried out, the College stands ready to undertake it.

Summary.

STATEMENT OF CONDITION.

1. PLANT.

A conservative valuation of the property of the College shows:

Land	$100,000
Buildings	74,670
Furniture	2,225
Library	25,364
Teaching equipment, including apparatus, machinery, illustrative material and scientific collections	85,415
Total	$287,674

2. FACULTY.

The Faculty consists of 12 professors, 1 botanist, 2 assistant professors, 4 instructors, 1 librarian, 1 assistant instructor.

The resignation of President John W. Gilmore took effect at the close of the college year 1912-1913. Professor Donaghho served as Acting Dean for the year 1913-1914. The new president, Arthur L. Dean, took up the executive work in June, 1914.

Professor F. G. Krauss has resigned to take effect in January, 1915, and Mr. Jared G. Smith has been secured to take charge of the work in agriculture.

Maria Heuer has been appointed Instructor in Modern Languages, giving instruction in both French and German.

Miss Florence Lee, Assistant Professor of Domestic Science, has been compelled by ill health to take a leave of absence and her place has been most acceptably filled by Miss Louise Peirson.

3. STUDENTS.

During the college year 1913-1914 there were 121 students in attendance of whom 57 were working for credit; during 1914-1915 there are 108 in attendance with 64 working for credit.

4. Investigations.

Most of the departments are carrying on investigations. Such work should form a most important feature of the activities in Agriculture, Engineering, and the various other branches of science. The results of some of the work have been published, some have been privately communicated.

5. Courses of Study.

The College provides courses in:

(*a*) Agriculture.
(*b*) Engineering:
  1. Civil.
  2. Mechanical.
(*c*) Sugar Technology:
  1. Agricultural Division.
  2. Engineering Division.
(*d*) General Science:
  1. Physical and chemical group.
  2. Biological group.
  3. Domestic Arts and Sciences group.

PROGRAM OF DEVELOPMENT.

1. Roads.

The roads through the college grounds are wretched, and at times have been impassable for automobiles. Permanent development of campus and farm wait on the locating and building of proper roads. The College desires to build such roads as experimental roads to test various materials and methods under Hawaiian conditions. This will give us permanent roads, an engineering investigation of great practical value to the Territory, and a valuable means of student instruction.

2. Grounds.

The present unkempt condition of the College campus is not creditable to the Territory of Hawaii. We wish to establish a collection of growing tropical trees and shrubs which shall be properly labelled and become an asset of the

greatest educational value, and in a short time a place attractive to residents and tourists. A start on such an arboretum can be made with the expenditure of about $3000.

3. College Farm.

Much of the land set aside for the farm is undeveloped. This is wasteful from every point of view. Funds are imperatively needed for fencing, clearing the land, and for irrigation ditches. The College has been assured of money from the Conservation Fund for new buildings for handling milk and milk products, and for experimental work in breeding and feeding swine. In addition to these buildings a barn is needed and, if work is to be carried on with poultry, a new poultry plant.

The farm should, once for all, be cleared up, fenced, and put on a working basis.

4. Engineering Experiments.

Experimental work in engineering is hampered by lack of room for setting up our machinery and apparatus. A laboratory building can be erected for about $3000. If the experimental work on roads is to be carried out such a building is indispensable. A sum of not less than $500 per year is required for maintaining such a laboratory and providing for experimental materials.

5. Instruction.

Plans are made for a course "Preparatory to Business" to fit men for business or government positions or serve as an introduction to the study of law. Such a course would not cover the ground of commercial courses in high schools, but would include history, government, economics, accounting, money and banking, commerce, etc. Establishing such instruction will require adding one man to the Faculty and rearranging the work of some of the present members. The added cost to the Territory appears in the increased requirement for instruction under the head of history, due to transfer of work and adjustment of salaries between Federal and Territorial funds.

6. Library.

The College has a large accumulation of unbound books which are unavailable for use and subject to deterioration. At least $850 is needed for binding and for pamphlet files. A properly kept up library is a necessity for scientific work.

7. Publications.

A series of bulletins published by the College has been started. Such publication of the results of original investigation is an important factor in the development of the institution. A substantial amount of material is already on hand awaiting funds for publication.

FINANCES.

Beginning with July 1, 1914, a new system of cost keeping was put in operation at the College of Hawaii. The accounts to which Territorial money are now charged are: Farm, Office, Building maintenance, Grounds, Furniture, Library, Languages, History, Art and Design, Cooking Classes and General.

Farm expenditures must be met from farm receipts deposited with the Treasurer of the Territory under the provisions of Act 44 S. L., 1911. A few items were charged to Salaries, Pay Roll and Expenses before this arrangement could be enforced.

Office charges include salaries of president and stenographer, and the running expenses of the office.

Expenditures of federal funds for buildings, grounds, furniture, or instruction in languages, history, or art and design are expressly forbidden and are therefore territorial charges.

The Library charges include the salary of the Librarian, binding of books, the incidental costs of library upkeep, and the purchase of books and periodicals which cannot be purchased from the federal funds assigned to the various scientific departments.

The cooking classes account covers the expenditure of the laboratory fees paid by the students for the purchase of groceries and other supplies for the cooking laboratory.

Up to the present time very few items have been charged to "General."

Although this system of charges was not in effect during the fiscal year 1913-1914, it has been possible to divide the expenditures from the vouchers on file. Several additional accounts are required for certain categories of expense not necessary during the present year.

The last Legislature appropriated $20,000 for current expenses and $3000 for buildings, grading and other improvements. During the first year of the biennial period $13,730.12 were spent, thus overrunning the $10,000 belonging to that year by several thousand dollars and leaving only $6269.88 for the present fiscal year. This overrunning of the propor-

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